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Dominion Dental Journal

VOL. XXIII

TORONTO, JANUARY 15, 1911.

No. 1

Original Communications

CARE OF THE TEETH.

Prepared for the Canadian Oral Prophylactic Association.

HISTORICAL.

It is quite evident, according to researches made through the history of ages, that it has always been considered of more or less importance that the teeth, as well as other parts of the body, should be cleansed, in order that the individual might enjoy good health and the esteem of his fellows.

The earliest Chinese works on medicine show that eighteen hundred years before Christ some attention was given to the care of the teeth.

About 1500 B.C., some of the Hindu sacred works, as well as those on medicine, contained, among other laws of health, rules for the cleansing of the mouth after eating.

The early Romans, too, had knowledge of the advantages to be derived from the cleansing of the teeth. J. Grasset St. Sauveur, writing of these people in "L'Antique Rome," said: "In order to keep their teeth clean and white, they used a great deal of a certain liquid of curious composition. They knew the use of *small brushes* and toothpicks of gold, of silver and of quill." Jacob von Faulke, in "Greece and Rome, Their Art and Life," referring to the matter of growing old, says: "She resisted to the last, concealed her wrinkles, helped her figure with judicious padding, and replaced lost teeth by artificial ones of ivory, fastened with gold."

As early as the second century dentistry was a recognized art, but during the dark ages, with many other of the arts and sciences, it languished, and had it not been for the monks, to whom the later generations are greatly indebted for preserving records, it might have been lost sight of entirely. In fact, it is believed they did more or less to relieve suffering due to diseased conditions of the teeth.

With the exception of references to cleaning the teeth, history shows that about the only form of dentistry practised by the

ancients was the restoration of lost teeth by artificial substitutes. In those times artificial teeth were very crude affairs, and the wearers were usually objects of ridicule. If the dentistry of to-day

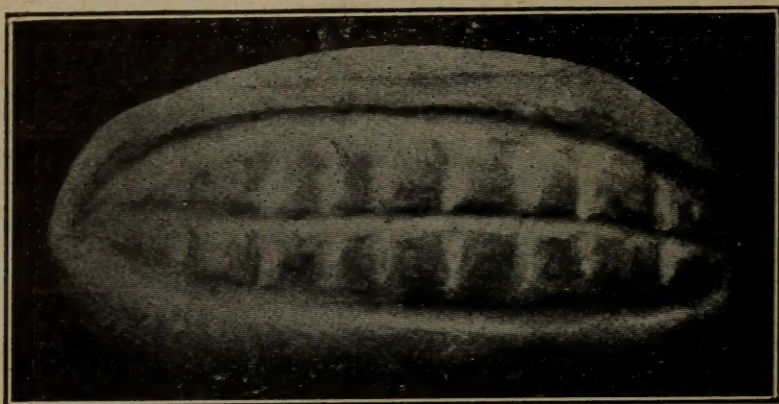


Fig. 1.—Worn behind the lips for appearance only.

were not of such a high order we would probably take more care to preserve our natural teeth.

The profession of dentistry has made very decided progress during the past fifty years, and has now reached a high state of perfection in the matter of repair of diseased teeth and the replacement of lost ones by artificial substitutes.

DENTISTRY OF THE FUTURE.

A great deal of attention is now being given by scientific men to the study of prevention of disease in all its forms, and much success has already been achieved along this line.

In dentistry to-day the trend of thought is especially directed toward prevention of decay and other pathological conditions by a system of cleansing of the mouth and teeth and the regulation of the quality of the secretions. Oral prophylaxis is the name applied to this particular branch of dentistry, which is receiving more and more attention each year. It is believed that in time the chief energy of the thorough and up-to-date dentist will be expended along this line, in order that destruction of the teeth may be prevented. He will take particular care, too, to instruct his patients in the best methods of caring for and cleansing their mouths and teeth. The dentistry of the future will be a preventive rather than a curative treatment.

As we become more enlightened upon the subject of cleanliness, we will begin to reap more fully the benefits of its practice; in fact, we are now able to control to a great extent the spread of disease, by vaccination against some forms, purification of drinking water, food, etc., prevention of accumulation of filth, and cleanliness of our persons and surroundings generally.

A great many forms of disease are caused by germs which enter the body, chiefly through the mouth, which latter has been aptly termed "the vestibule to the whole system." The members of

ORIGINAL COMMUNICATIONS

the profession of dentistry realize this fact, and are putting forth their best efforts to take advantage of the opportunity, which is theirs, as guardians of the mouths and teeth of the public, to not only prevent destruction of the teeth by caries, but also to control, in a large degree, many other forms of disease.

It is confidently anticipated that by the intelligent practice of oral hygiene more will be accomplished to prevent decay of the teeth during the next twenty years than in all the ages that have gone before.

FUNCTIONS OF THE TEETH.

The teeth have, among others, three most distinct functions, viz., mastication of food, assistance in articulation of words, and that of giving beauty and expression to the face.

MASTICATION.—This is the chief function of the teeth. The crushing of the food is not the only end accomplished in mastication, but during the process the glands situated in the mouth are stimulated to secrete large quantities of saliva; these fluids become incorporated with the food and perform the first step in digestion. If the teeth and other tissues of the mouth are in an unhealthy

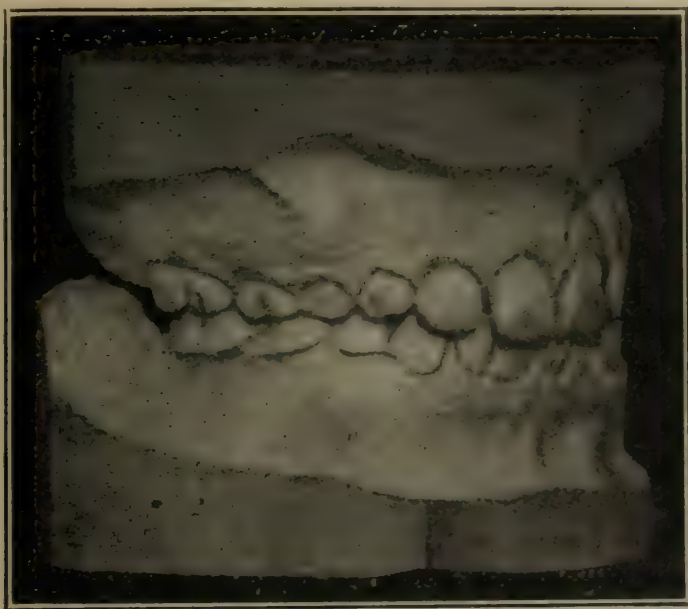


Fig. 2.—A normally arranged set of teeth.

state, their use is avoided, and the soft, pulpy articles of diet are chosen—those which will *slip down* with little or no mastication. In such cases the food is taken into the stomach without the normal quantity of saliva which is required in digestion. The food should be masticated until it is ground to the very finest consistency.

To give a little idea of what thorough mastication means, tender beefsteak should be crushed between the teeth about fifty or more times before swallowing; roast pork, thirty to forty times; tender chicken, thirty to forty times; bananas, which are usually

bolted, and are very injurious on this account, should be chewed twenty times at least to give the salivary glands an opportunity to secrete sufficient saliva to help in digestion.

There is great power in the muscles of the jaws, some men being able to close their teeth together with a pressure of two hundred and fifty pounds. This power is there to enable the teeth to crush the food. Those people who have not such great strength in their jaws can develop it to a certain extent by thorough mastication, just as other muscles of the body are developed by exercise. Muscles in all parts of the human and animal anatomy are developed according to the demands placed upon them.

Mr. Fletcher's demonstrations of what can be done in the preservation of health and strength by mastication has gained the attention of the scientific world.

Digestion is dependent not only upon the normal working of the stomach, but also upon other organs of the body. If the food is clean, properly prepared and well masticated before entrance into the stomach, the other organs are materially assisted in the work of digestion, but if the food is bolted and not mixed properly with the saliva, it will not be thoroughly digested, and as a consequence, tainted breath, headache and a train of other ill effects will follow.

ARTICULATION.—The full compliment of teeth in normally



Improper arrangement and closure of teeth.
Fig. 3—Before correction.

Fig. 4—After correction.

developed jaws is necessary for the distinct pronunciation of words, a matter of particular importance to public speakers and singers.

Nature is often interfered with in her work of development, resulting in malformations and irregularities of various kinds. Cleft palate, for example, is a failure of the right and left halves of the upper jaw bones to unite in the median line; this leaves an opening between the mouth and the nasal cavity, and makes articulate speech and swallowing almost impossible. If the cleft is in the anterior portion of the bone, it may prevent the union of the tissues of the lip, a condition known as hare-lip, which is most disfiguring. Cleft palate is easily corrected in childhood by the surgeon, but may be remedied in some cases even in the adult. Where for any reason an operation to close the cleft cannot be

performed, it is possible to have inserted by a dentist an appliance which will cover the opening in the palate and improve articulation and deglutition.

Irregularity of the teeth also interferes with speech, particularly in those cases where the arch, or jaw, is very narrow. This narrowness of the arch is due also to lack of development of the bone. The work of correcting this condition is known as orthodontia, a science which has made rapid strides during the past ten to twenty years. In many of the large cities a few men are now devoting their whole time to orthodontia, but many dentists do more or less of it in their general practice. Irregularities of



Fig. 5—Cleft palate, before operation



Fig. 6—After operation

the teeth should be corrected just as soon as they manifest themselves. The treatment is almost painless and fairly easy in the case of the child, but becomes more complicated and difficult as years advance.

The loss of even one tooth may affect the speech somewhat, and the result of the extraction or decay of several is sure to be disastrous. The posterior teeth are really more valuable than those in



Fig 7—Narrow arch.

front, perhaps not from the standpoint of appearance or articulation, but in general usefulness. Their loss, too, has more effect upon the face than most people realize.

EXPRESSION.—No organ, or set of organs, has greater effect upon the expression of the face than the teeth. If they are decayed or irregular, an otherwise beautiful face may be marred very decidedly. King Solomon, whose court was the home of fashion and beauty, alluding to beautiful teeth, said: "Your teeth are like a



Fig. 8—Depression of the mouth due to loss of the teeth.

flock of sheep, even shorn, which comes up from the washing." Ovid, a Latin poet, recommended as an antidote to love, "to make her smile who has bad teeth." He also said to a young lady, "I can perceive your attention to the graces by the whiteness of your teeth."

The cleanliness of our teeth is indicative of our tastes. A particular charm in many faces is the regularity and beauty of the teeth, giving to the mouth a natural and pleasing expression. If any are lost, or do not lock correctly with their antagonists when erupting, the natural development of the entire structure will be interfered with and irregularity will follow, changing more or less the whole expression. When a tooth is lost, those adjoining gradually tip into the space, and soon their usefulness is interfered with; it is this shifting of the teeth which often causes an irregularity. There is a correct position in the dental arch for each tooth, and if from any cause even one is misplaced, it is liable in time to affect the whole set. It is almost as great a loss to lose a tooth as to lose a finger.

Adenoids, an hypertrophy of the tonsil, situated at the back of the nose, a condition from which many children suffer, has often a very marked effect upon the teeth, and consequently



Fig. 9.

Fig. 10—Typical mouthbreather

upon the face. This enlargement of the tonsil closes the posterior openings of the nose, and the child is compelled to breathe through its mouth. If this abnormal respiration continues over a long period, the upper front teeth will protrude, and the lower lip roll in behind them. This disfigures the face very decidedly. The adenoids should be removed by the surgeon and the teeth drawn

back to their normal position by the orthodontist or dentist, so that the child can close its lips and breathe normally.

WHAT IS DECAY OF THE TEETH, AND WHAT IS THE CAUSE?

Dental caries is a disintegration or breaking down of tooth tissue, resulting from the action of certain species of micro-organisms. Tooth decay is persistent; it goes on very rapidly in some mouths, and more slowly in others, according to the condition of the secretions, the general health and the care taken in cleansing the mouth and teeth.

Neglect of proper cleanliness of the mouth is one of the chief causes of tooth destruction, as well as other diseases.

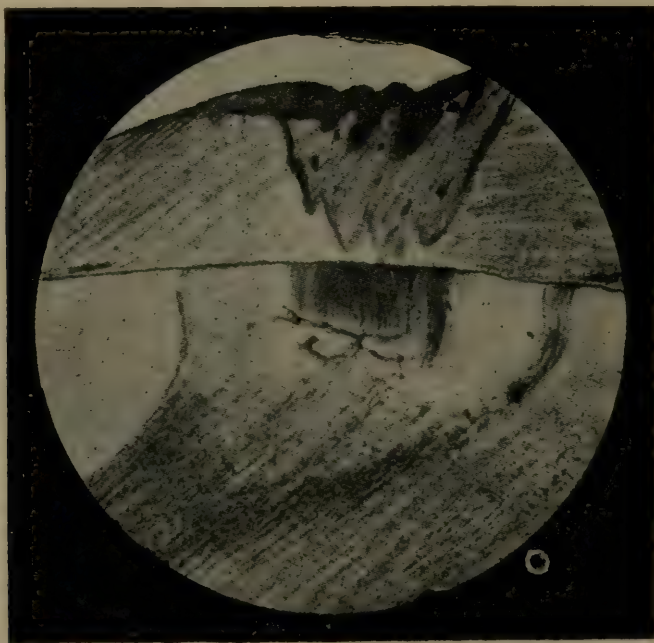


Fig. 11—Decay of Dentine, the dark parts show masses of bacteria

Each germ disease, whether it be decay of the teeth, tuberculosis, or any other, is the result of the action of specific forms of bacteria. The warmth, moisture and presence of food in the mouth make it a desirable habitat for germs. In the average mouth each drop of saliva may contain between four and five thousand germs, and in a neglected one as many as one billion one hundred and forty million micro-organisms have been found. In almost any mouth there may be present the germs of many diseases, such as diphtheria, typhoid fever, cholera, pneumonia, tuberculosis, etc., and yet if reasonable care is taken in the cleansing of the mouth, and the general tone of the system is kept up, the individual may never contract any of these.

The particular germs which cause decay of the teeth do so in this manner: They seem to attach themselves to the smooth surfaces of the teeth by means of little gelatinoid plaques, and if surrounded by a suitable soil in which to grow, such as a collection of food, and are not disturbed, their action upon the food causes the

production of an acid. It is this acid which destroys the teeth. The colonies of germs cover themselves in with the plaques which they form, and the acid which is produced, by their action upon the food is held in contact with the teeth by these plaques, and is not diluted or washed away by the saliva. The acid first softens the

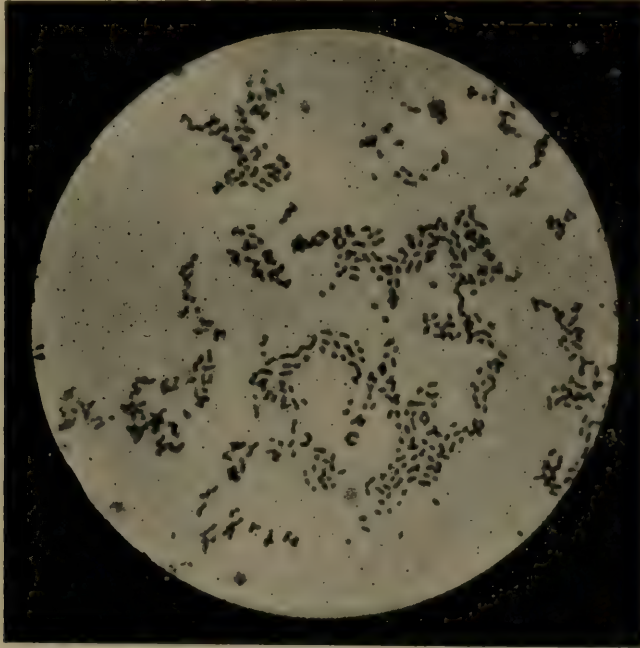


Fig. 12—Germs of tooth decay, magnified 1000 times

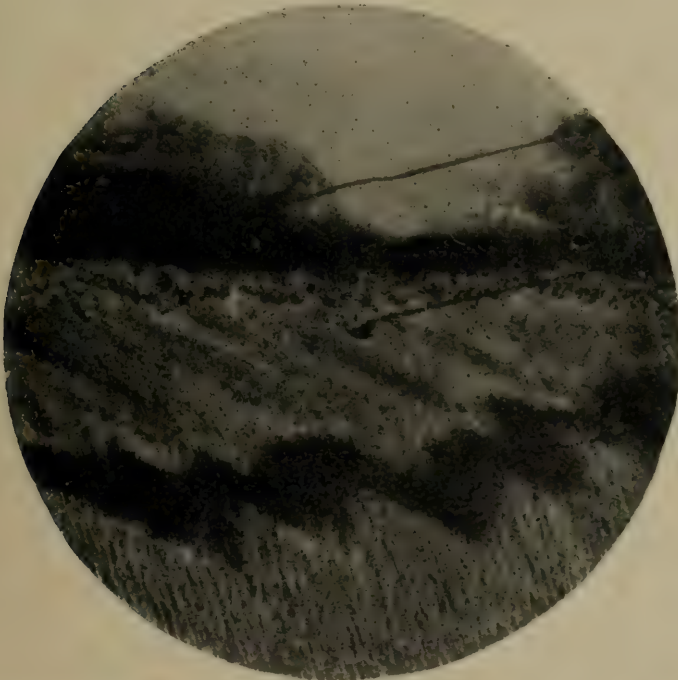


Fig. 13—Showing Gelatinous plaque under which the acid dissolves the tooth structure surface of the enamel and thereby makes it rough, which facilitates the lodgment of more germs and the food in which they grow. The destruction goes on until the enamel is penetrated and the dentine reached. This latter part of the tooth is less dense than the enamel,

and is destroyed by the acid much more rapidly; a tooth which may have only an opening through the enamel large enough to admit the point of a pin, may have a very large cavity of decay in the dentine. The germs crowd into a cavity of this kind, and the food being constantly supplied to them, they grow luxuriantly.

Sweet and starchy materials form the best soil for the growth of bacteria. Their first action upon the food is to transform the starchy portions, such as bread and potatoes, into sugar; next the sugar is changed into an acid. It may thus be readily understood why sweet things generally are so destructive to the teeth, as the acid which causes the decay is formed very quickly direct from the sugar.

Lack of mastication is a cause of decay, as will be shown further on.

Biscuits, bread and butter, candies, etc., eaten by children at bedtime, without cleansing of the teeth afterward, is responsible for the destruction of millions of teeth.

WHAT ARE MICRO-ORGANISMS?

Micro-organisms, or bacteria as they are sometimes called, are not small animals, but are really species of the lowest forms of plants and require a soil in which to grow.

It is the function of the higher forms of plant life to build great structures, such as the forests, fruits, flowers, etc., and to the lower forms the arduous task of destroying them. These micro-organisms are everywhere to be found. Some species purify, to a certain extent, the water we drink, by destroying the organic substances in it.

The lower forms of plant life do not build largely as do the higher forms, yet they multiply greatly and change chemically—decompose—great quantities of matter that are built up by life, as exhibited in the animal and vegetable kingdoms, and return the materials again whence they came, generally speaking, to earth, air and water.

There are many gradations between the highest and lowest forms of plant life, and it is difficult to draw a dividing line between them.

Micro-organisms grow in organic matter. There are two distinct classes, those which generally grow only in dead organic matter, and those which grow ordinarily in living organic matter, such as in animals or plants. There is another division also, those that cause disease and those that commonly do not.

Each germ disease is caused by the growth of a particular form of micro-organism. Certain species will grow in man and some animals, and not in others. Cattle, for instance, may contract small-pox, but no other animal will, so far as known. None of the animals have typhoid fever, measles, and many other diseases so fatal to man, nor do any of the animals have destruction of the

teeth by caries. Many of them have tuberculosis. If a person is exposed to a certain disease, and does not contract it, he is said to be immune, that is, there is something in his system which seems to protect him from this certain disease. The hog is immune to snake poison, the bite of a rattlesnake being of no consequence to that supposedly stubborn animal.

If a person survives an attack of what is known as a self-limiting disease, such as smallpox, typhoid fever, measles, yellow fever, etc., he usually becomes immune to that particular disease. Children who survive diphtheria are immune for a time, but with this, as well as a few other diseases, immunity is not permanent. There are a few exceptions to this rule in some of the self-limiting diseases. This condition of immunity is brought about by the development in the blood, apparently by reason of contact with the particular virus, an antidote to the poison which has produced the disease. If a person who is physically strong contracts any of these diseases, the antitoxin is developed very rapidly in the blood, the germs are thus prevented from growing, the patient recovers, and that antidote developed in the blood seems to remain usually throughout the life of the individual. If a person is already in delicate health, the system has not the power to cope with these micro-organisms and death comes more or less quickly as a result of their development.

It is possible, also, to become immune, or nearly so, to decay of the teeth, by continual battle against the germs which cause their destruction.

WHAT CAN BE DONE TO PREVENT DECAY?

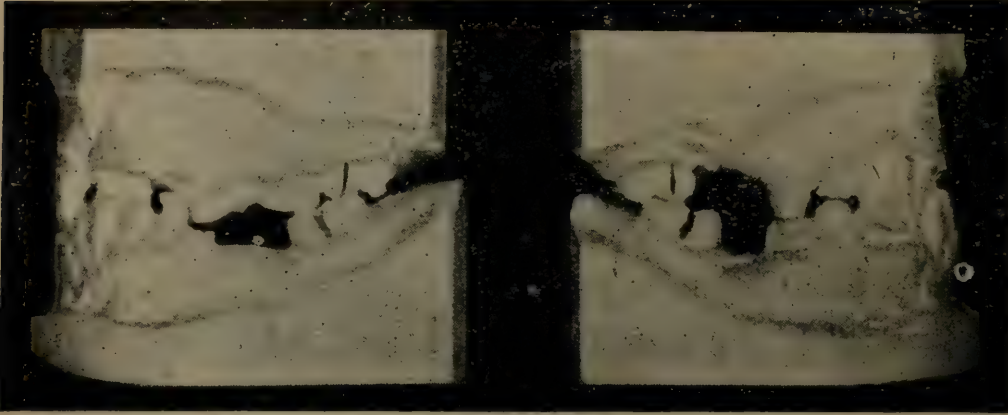
The first requisite is that the mouth and teeth must be perfectly clean—the latter shining. *Cleanliness is the best known preventive of dental caries.* The teeth are not always perfectly formed when they erupt, and the development of the crown or exposed portion stops before they appear through the gum. The imperfections in the enamel, when any are present, are usually so small that they would not be noticed, except upon careful examination by a dentist. All defects should be repaired with fillings, and if there is any irregularity of the teeth, this, too, should be corrected if at all possible.

If parents will take their children to competent dentists as soon as the temporary teeth have erupted, and see that every tooth is in perfect condition, then the little ones will have a fair start, and cleanliness will be the main factor thereafter in the preservation of the teeth. Of course it is desirable to have the teeth examined from time to time, in order that any new cavities forming may be repaired early, and to see also that the permanent teeth as they come along are erupting in their normal positions and are free from imperfections.

It is unwise to allow the first, or temporary teeth, to go to

destruction without any effort at repair. The too early loss of these teeth is responsible for many irregularities. In order to get the very best results, the temporary teeth should be kept in perfect condition until their successors shove them out.

The most important teeth of the whole set are the first permanent molars, and these are often decayed beyond repair in the



Figs. 14 and 15 show a case in which the temporary teeth in the lower jaw were lost too soon and allowed the first molars to tip forward. The dark lines indicate where the teeth should be.

mouths of some children before a dentist is consulted. These molars erupt about the sixth year, immediately behind the temporary teeth, both upper and lower, being the sixth tooth from the median line of the mouth. Mothers very often mistake these for temporary teeth, and do not value them on that account, but if they realized how important it is to preserve the temporary teeth, as well as the permanent ones, there would be a great improvement in the masticatory apparatus of the rising generation, both in utility and appearance.

Teeth which are irregular are much more liable to decay than those that are normally placed, because the irregularity facilitates the lodgment of food, and it is difficult to cleanse them with the brush. Other very serious diseases of the teeth and surrounding tissues, such as pyorrhoea, are often due to irregularities.

The teeth in some mouths seem to be more soft than in others and decay more rapidly, so much so that many people think their teeth are so "soft" that it is useless to try to save them from destruction. It is not the "hardness" or "softness" of teeth which governs their decay, but their environment. The saliva varies greatly in different mouths, and it is this variation, more than anything else, which has to do with the apparent resistance of some teeth to decay, rather than any quality of the teeth themselves.

In mouths where the saliva is very tenacious and stringy, decay usually goes on very rapidly, because the teeth become coated over with a viscid film, making a suitable abode for the germs which cause decay. Good vigorous use of the tooth brush several times a day, accompanied by thorough mastication of the food, will in time change this condition of the saliva to that of a clear,

healthy consistency. This "ropy" saliva is very often the accompaniment of a nervous disposition, and the teeth are usually very sensitive. When the saliva is gotten into a healthy state, the extreme sensitiveness of the teeth will disappear. When a person is in a delicate state of health, too, the saliva is not normal, and decay of the teeth goes on more rapidly. There are very many conditions which change the character of the secretions. To prevent the teeth from decaying, one must keep up the tone of the general health, in addition to the proper use of the tooth brush; the poorer the health, the more carefully should the mouth and teeth be cleansed.

Mastication plays an important part in the preservation of the teeth. Any race of people who live upon a class of food that requires a great deal of mastication before it can be swallowed, invariably have little or no decay of the teeth, because during the vigorous chewing of the food the teeth are brushed and the gums massaged very decidedly. Watch a horse chew his food; his teeth do not decay, and rarely give any trouble, except when worn down by hard mastication or broken off by accident of some kind. The hay and oats are hard substances, and during the thorough mastication which they receive in order to be swallowed, the teeth are beautifully polished. The oats contain a great deal of starch, the very substance upon which the germs of decay thrive best, and yet decay does not occur.

It is believed that our forefathers had better teeth than we, and this is accounted for chiefly by the fact that their diet consisted of plain materials that required vigorous chewing before they could be swallowed. They had not, as we have to-day, so many forms of sweet, mushy food; they did not, perhaps, bother very much with tooth brushes, either, but their food did the work which we must do now with our brush. It is well to have for each meal at least one article of diet which requires thorough mastication, and for a final dessert nothing better can be eaten than a good apple, as it massages the gums and clears away to a certain extent any food which has lodged in the interspaces between the teeth.

It is unwise to use liquids with which to "wash" the food down into the stomach. If one desires to drink during meals, he should do so when the mouth is empty.

Children should be given plenty of food that requires thorough mastication before it can be swallowed; instead of mincing it up for them, *let them do the mincing with their teeth*. It has been suggested that "if children could be sent to a chewing school, as they are now sent to a kindergarten, there would be a marked improvement in the race"

The teeth, and also the soft tissues surrounding them, require plenty of exercise, in order to develop them to their most perfect condition, just as do all other parts of the body.

HOW TO CLEANSE THE MOUTH AND TEETH.

The best known means of cleansing the mouth and teeth, other than by mastication, is by the intelligent use of a good tooth brush, together with plenty of moderately cold pure water. Most brushes which are offered for sale are too large, but it is possible now to obtain brushes which are nearly ideal. One should use a brush of such a size that it may be readily passed between the cheek and the most posterior tooth. In the permanent set this is the wisdom tooth, which rarely receives proper care, because a large brush will not reach it handily, and thus it often decays early, and is looked upon by many as a tooth of poorer quality than the rest, which is not necessarily the case.



Fig. 16

- 1 is for children and those wearing orthodontia appliances and bridges.
- 2 is the best sized for all purposes.
- 3 Is the three rowed brush, the largest sized brush that should ever be used.
- 4 Is for brushing the lingual surfaces of the lower teeth.

The head of an ideal tooth brush for an adult—that is the portion which carries the bristles—should not be longer than one and a half inches or wider than one-third of an inch. The bristles should be arranged in two rows, each of about seven good-sized *tufts of*

equal length, and one tuft additional to round off the end. The tufts of each row should be directly opposite each other and the bristles of unequal length, the centre bristles in each tuft transversely being slightly longer than the rest, giving a serrated face to the brush. The bristles should be no longer than half an inch, and of medium stiffness for the average adult. Where the gums are inflamed, softer bristles are indicated for a time, until the tissues become normal and healthy.

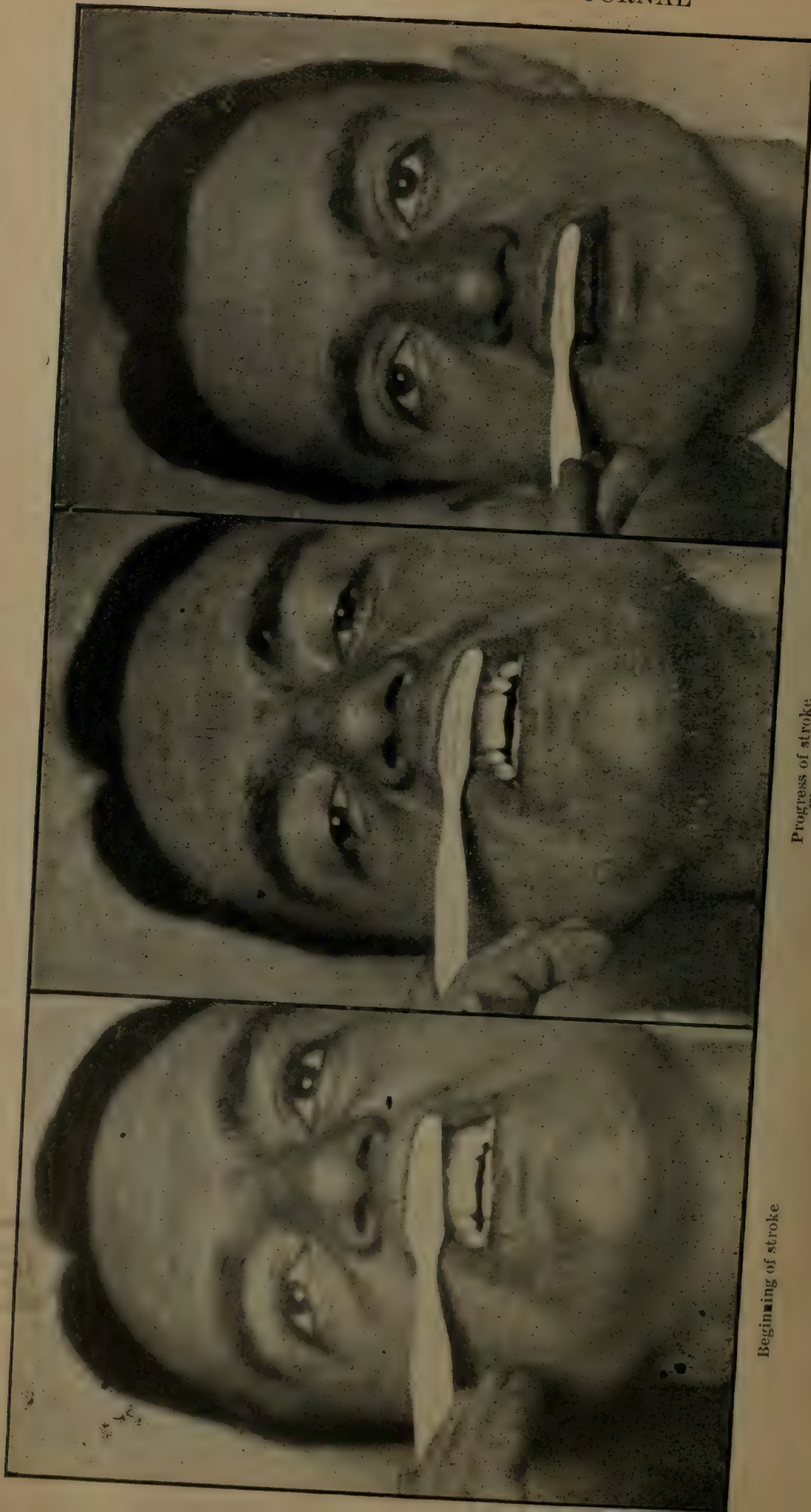
Young children, or those wearing orthodontia appliances, should use a brush with but one row of six or seven tufts, the bristles being shorter than those in the adult's brush.

For those persons who may prefer a slightly larger brush than the one described as the ideal for adults, one of three rows of about eight or nine tufts would be the extreme size to do the work properly.

The head as well as the handle of the brush should be slightly curved, the head a little more than the handle, with the concavity on the side containing the bristles. This curve in the head should be just sufficient that the ends of the bristles will nicely fit against the front teeth. The handle should be somewhat flat so that it can be held comfortably without slipping in the hand, and be easily controlled. All edges of the head and handle should be rounded and the bristles set within one sixteenth of an inch of the end and sides of the head. The whole brush—head and handle—should not be longer than five to six inches, and should not have a long tuft at the end.

There is a right and a wrong way to use a tooth brush, and most people employ the latter method. The old see-saw manner of using the brush is a very poor one, as only the high spots are brushed. The motion should be a *vertical* one, placing the brush high (or low, if for the lower teeth) upon the gums and then rotating it so that the bristles pass over both the gums and teeth. A very short, horizontal motion will drive the bristles between the teeth, dislodge the food and prevent the formation of tartar. To cleanse the lingual, or inner surfaces, the brush should be used in a similar manner; for the upper, place the ends of the bristles in the centre of the roof of the mouth, and roll it down over the gums and teeth; for the lower, raise the tongue and place the brush low down upon the gums, then roll it up over the ends of the teeth; the bristles upon the end of the brush only may be used in some parts. These movements must be repeated several times, using plenty of water. The grinding surfaces are cleansed by the horizontal use of the brush, as is usually practised for all surfaces of the teeth.

This method will seem awkward at first, but with a little practice it will become just as natural and easy as the old way of brushing across the teeth, with the added advantage that by using the brush in this manner the bristles pass in between the teeth to a



Beginning of stroke

Progress of stroke
Fig. 17

Finish of stroke



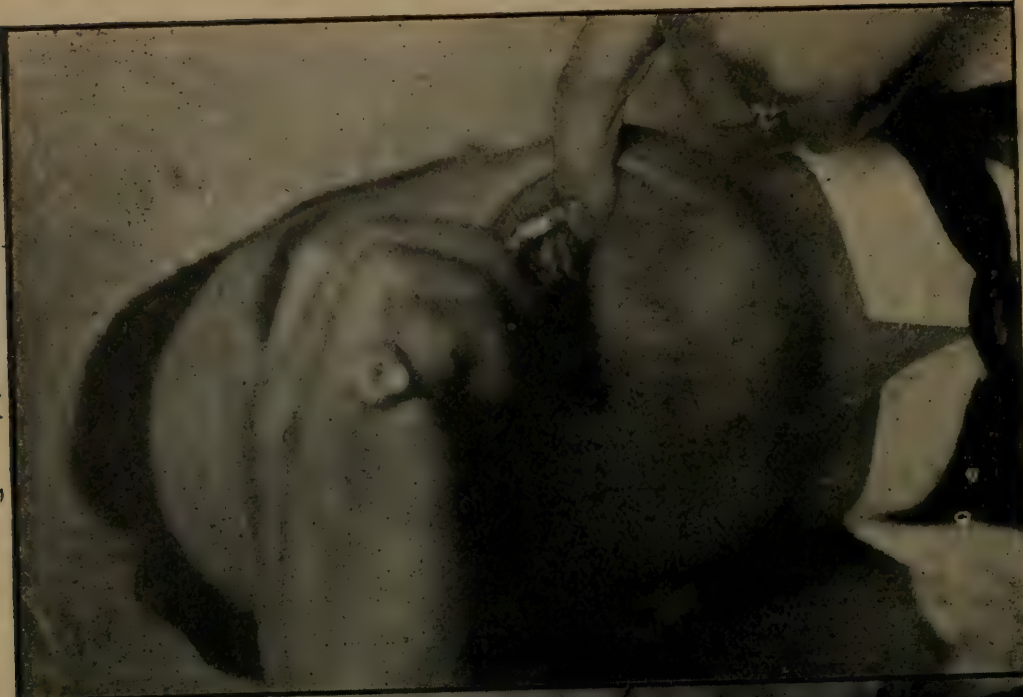
Finish of stroke



Progress of stroke
Fig. 18



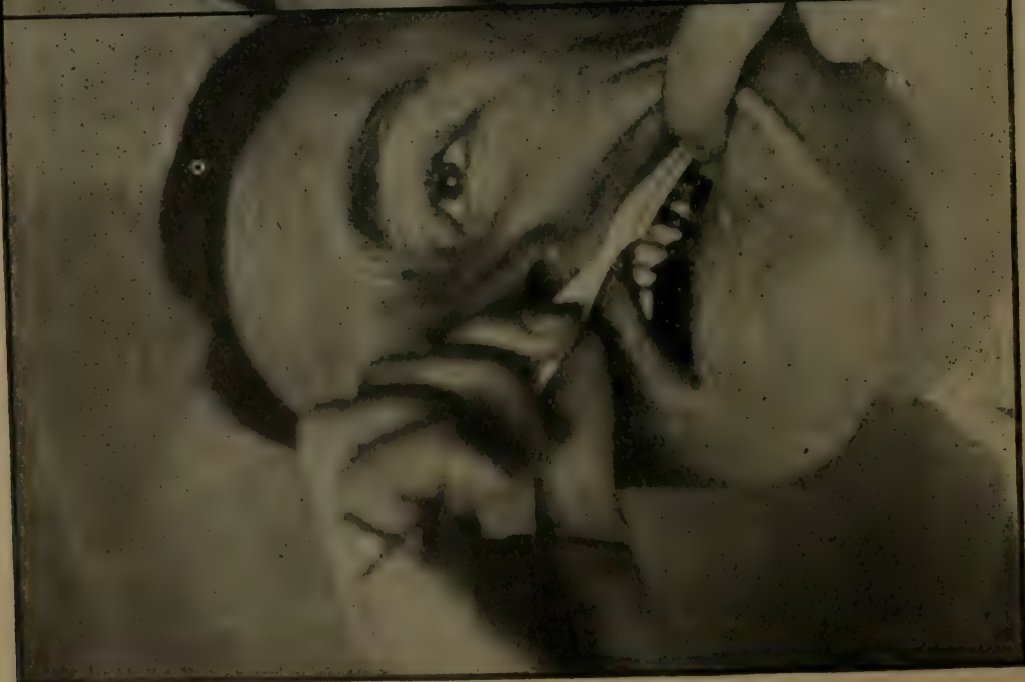
Beginning of stroke



Finish of stroke



Progress of stroke
Fig. 19



Beginning of stroke



Finish of stroke



Progress of stroke
Fig. 20



Beginning of stroke



Use of lingual brush



Progress of stroke
Fig. 21



Beginning of stroke

certain extent, and cleanse more or less the approximal surfaces. By the horizontal motion of the brush across the teeth the gum tissue overlying prominent teeth, such as the cuspids, will in time recede,



Fig. 22—Circular movement in brushing, the bristles following the arch of the gums as indicated by the dotted lines.

exposing the necks of the teeth above the enamel. These exposed surfaces of the roots soon become discolored and sensitive.



Fig. 23

Fig. 24

It may be necessary occasionally to use a good tooth powder or a little camphorated chalk to remove stains, but any preparation used should be one which does not contain ingredients that are injurious to the teeth, and whatever is used should be carefully washed from around the teeth.

Rinsing the mouth thoroughly is an excellent means of dislodging any collection between the teeth. It is possible by the action of the tongue and cheeks to force a liquid back and forth between the teeth with considerable pressure. Try it. Many persons do not know how to properly rinse their mouth. A very palatable and refreshing wash for rinsing the mouth may be made by adding about ten drops of oil of peppermint to three ounces of water, using a few drops of this solution in sufficient water to rinse the mouth two or three times.

No preparation could be used in the mouth that will kill the germs; they must be brushed away.

Tooth soaps are very injurious and should not be used. Pastes, as a rule, are not as good as powders, because most of them contain sugar, simple syrup, etc., substances which are favorable to the

development of bacteria. The advice of a dentist should be sought in reference to the selection of any preparation with which to cleanse the teeth, as many of the articles upon the market for this purpose are very injurious. Some persons use powdered charcoal, pumice or cigar ashes. One might use something of this kind once in several weeks, if the teeth become stained, but if the brush is diligently used two or three times a day at least, with the addition of a good tooth powder once perhaps every three or four days, there will not be much occasion to use a gritty substance.

It is advisable to have the teeth thoroughly sealed and polished



Fig. 25

by a dentist two or three times a year, because the approximal surfaces cannot be thoroughly cleansed by the brush.

When food lodges between the teeth, it can best be removed by the use of a quill toothpick. Toothpicks of wood are usually too large and rough, and considerable damage may be done to the gum tissue by their use. Where food lodges there is something wrong, and a dentist should be consulted, as the continual crowding of food into these spaces presses back the soft tissues and exposes the necks of the teeth, and thus decay starts at a point where the germs cannot be brushed away conveniently.

With care, the approximal surfaces of the teeth may be cleansed and polished by means of ordinary rubber bands or floss silk, but the use of these is a dangerous proceeding, because if the silk or rubber band is permitted to snap down upon the gums after it passes the "tight point" between the teeth, it will set up an inflammation in the soft tissues that will cause them to recede. These are all right when used by a careful dentist, but not so in the hands of the average person.

WHEN SHOULD THE TEETH BE BRUSHED?

To cleanse the mouth and teeth should be the very first duty in the morning, in order to clear away as thoroughly as possible the germs which may have fastened themselves upon the teeth during

the hours of sleep, when the tongue and salivary glands are inactive. It is desirable to get rid of these germs, so that they will not be brushed off by the food in mastication and carried into the stomach along with the breakfast. The teeth should be brushed after each meal to remove all particles of food which may have lodged around them. The most important time of all, so far as the preservation of the teeth is concerned, is after the last meal of the day, taking care to remove thoroughly all particles of food at this cleansing. During the hours of sleep the saliva is not flowing freely, neither is the tongue brushing the surfaces of the teeth; if there is food lodged around them, the germs will have several hours during which to grow undisturbed, and having this grand opportunity, night after night, for years, is it any wonder that they destroy teeth? Persons in delicate health, or those whose teeth are very susceptible to decay, would do well to cleanse the mouth and teeth before each meal; it will prevent the entrance into the stomach of many germs which more or less interfere with normal digestion.

HYGIENE OF THE MOUTH.

1. Good health is necessary to avoid disease.
2. Good health depends on good digestion.
3. Good digestion depends on good mastication and a clean mouth.
4. Good mastication depends upon good teeth.
5. To preserve the teeth from decay and keep the tissues of the mouth healthy it is necessary to keep the teeth and gums free from decaying food particles and to stimulate the circulation of the blood in the gums.
6. To assist in this masticate hard foods.
7. Soft foods cling to the teeth.
8. Teeth decay chiefly at night.
9. Brush the teeth before retiring and upon rising, and if possible after each meal. Rinse the mouth with an abundance of tepid water.
10. Use a tooth brush or brushes of such forms and sizes as will reach all the surfaces of all the teeth.
11. Brush the teeth from the gums towards the biting edges.
12. Use mouth preparations upon the advice of a dentist.
13. Consult a dentist as often as advised by him.
14. Good teeth and a clean mouth are more essential to the child than to the adult.

MODERN CROWN AND BRIDGE WORK.

By A. W. THORNTON, D.D.S., L.D.S., Toronto, Can.

Read before the Hamilton Dental Society, November 14, 1910.

From the November number of the *Cosmos* I take the following statement from a paper read by Dr. G. S. Staples at the Southern Branch of the National Dental Association, held at Houston, Texas, May 4, 5 and 6, of the present year. The paper was entitled "A Warning Against Fads," and the quotation is: "Then came crown and bridge work, which has been the greatest fad, and worst fraud, that has ever been imposed on a long-suffering and patient public, and still the wretched work goes on, to the everlasting shame of the dental profession. When crown and bridge work is called for in practice there is nothing that will take its place, but I honestly believe that in more than ninety-nine per cent. of cases an amalgam filling instead of a crown, or a small plate instead of a bridge, would be much better."

Permit me to quote one other sentence which Dr. Staples used in closing the discussion of his paper, viz., "The average dentist is like the average citizen in any business, if he has anything to do he does his work right away, and thinks about it afterwards."

I wonder if Dr. Staples has been guilty of the fault which he criticizes in others. Did he write his article without due thought? He says, and says truly, that many crowns are adjusted where amalgam fillings would give better service. But that only proves the human nature is frail, and that men are selfish, and that crowns are inserted so that the patients may see the gold and thus be made to believe that they are getting better value for the fee charged. It does not prove that crown and bridge work is either a fad or a fraud. Wholesale condemnation expressed in vigorous language may, and very often does, attract attention, but the extravagance of the language only emphasizes the falsity of the statement, and because of this men fail to give to the subject under discussion the consideration which perhaps it merits.

Does crown and bridge work deserve the condemnation which at the present time it is receiving from self-appointed critics? What is the legitimate place of modern crown and bridge work in the legitimate practice of dentistry?

We will admit at the outset that there has been a great deal of faulty, very bad, abominable, unwarranted and ill-advised crown and bridge work done. We will admit that many thousands of good teeth have been ruthlessly mutilated and finally lost through such methods of practice. But what does that prove? That crown and bridge work is a fad or a fraud? No. It proves only that many dentists lack skill in the technic of construction and the intelligent judgment which are necessary to accomplish the best results.

it proves more. It proves that when men would add to, or take from, any part of the human mechanism, such addition or subtraction requires the mind of a master, the eye of a painter, the hands of a sculptor, the courage of a soldier, the sympathy of a mother; and when the last word is said along these lines, that we are then face to face with "life forces, vital energies," and that thus far we are only beginning to touch the fringe of these mysteries. But all this is true of operative dentistry, and of plate work as well as of crown and bridge work.

How many teeth have been filled with gold only to be patched and refilled, and filled again, and finally lost? How many millions of teeth have become sacrifices, no—burnt offerings, to partial plates? And still the wretched work goes on. Why? Because dentists are just ordinary men, with average mechanical ability and artistic taste, and, like other average men in all walks of life, they must of necessity devote most of their time, attention and energy to obtaining for themselves and those dependent on them "the bread that perisheth." A very small percentage of them, indeed, can adopt Theodore Cuyler's standard, however desirable that may be, and "be more concerned about making a life than about making a living." Our failures in every department of practice prove one thing more, viz., that dentistry has attained to such a state of perfection on this North American continent that nothing short of a restoration to natural and normal conditions merits any commendation. Let us try to keep in mind that there is a limit to human knowledge and human ingenuity.

Does crown and bridge work deserve the condemnation which it is receiving at the hands of self-appointed critics? What does modern dentistry owe to this particular branch of practice? That a great change, a change for the better, has taken place in the practice of dentistry in the past twenty years every intelligent person knows, no intelligent person will deny.

What are some of these changes?

The number of teeth extracted (in America) at the present time is but a very small fraction of the number extracted twenty years ago. When a partial plate becomes a necessity the amount of material in such an appliance is reduced to the minimum and the appliance itself is so adapted and attached to the remaining teeth as to give a sense of fixity and security which patients very much appreciate. As a result of preserving the natural teeth or of even the natural roots to which crowns are attached, the people of this continent are preserving their natural appearance into advanced years, and insurance companies tell us that the average span of life is being lengthened.

Why should this be? Because with the natural organs more food, and food of a better nature can be eaten than is possible where a denture is worn. Why? Because scientific tests have established this fact; that the pressure which it is possible to exert with a

denture supported wholly by the alveolar ridge and adjacent tissues is only from one-tenth to one-sixth of the pressure than can be exerted by the natural organs. Twenty-five years ago the dentists of this country were extracting teeth and making rubber dentures. That is not true to-day. Why? Because "the long suffering" public to which Dr. Staples refers has learned that a crown attached to a natural root, or an appliance attached to two or more roots, or crowns of natural teeth, to supply several lost teeth, is an infinitely better appliance than a partial plate.

The value of a natural tooth has become so enhanced that people of even moderate means refuse absolutely to have them extracted. Because of the possibilities of modern crown and bridge work a single natural tooth or even a single healthy root is an asset in many cases of almost inestimable value. A long-suffering public learned many years ago that a partial plate to-day meant a full denture in the very near to-morrow. The natural result was, that where one or two teeth were decayed the others were allowed to "go" until all were extracted and a full denture inserted. But modern crown and bridge work has changed all that. Now, where a considerable number has been lost the remaining teeth are brought into a healthy condition and utilized as supports in bridge work that in thousands of cases is so comfortable and natural that patients tell you they are never conscious of its presence.

Those desirable changes, viz., better prosthetic restorations; a greater appreciation of the value of the natural teeth; an increase of some years in the average length of life; preservation of the natural appearance to comparative old age; and last, though by no means least, a better social, financial and professional status for dentists have, I am convinced, been brought about very largely, because of the introduction and evolution of modern crown and bridge work.

What is the legitimate place of modern crown and bridge work in the legitimate practice of dentistry?

If from any cause the crown of any one of the ten anterior teeth be lost, and the root is in good condition, then a crown is surely the method of restoration indicated. A porcelain crown is the ideal restoration for all the teeth as far back as the second bicuspid and the only permissible restoration for the incisors or cuspids. The excessive destruction of tooth tissue in the removal of the entire crown of a bicuspid causes many operators to adopt the shell crown methods of restoration. In addition to the destruction of tooth tissue to adapt a porcelain crown, experience teaches that a dowel inserted into a root and a porcelain crown either baked to the dowel or attached to it with cement is a serious menace to the stability of the root, and that many roots are split by the lever force exerted by the dowel.

The most desirable crown of which I have any knowledge, for the ten anterior teeth, is a ready-to-wear crown with detachable

dowel and cast gold base, carefully adapted to the end of the root. This method of restoration possesses the following advantages:

1. It is easy to obtain a porcelain crown that matches in color and shape the corresponding natural tooth if it is still in the mouth.

2. There is no change of color due to the presence of the backing or the burning out of the coloring matter of the porcelain during the process of soldering.

3. It is not necessary to show any gold—a very decided advantage.

4. In case of fracture, repair is easily made.

I venture the assertion that not many years will elapse until the putting of porcelain crowns or facings through the fire in the making of crowns or bridges will be a thing of the past. So much for individual crowns.

How about bridges? If both bicuspid are missing, on one side or on both sides, what manner of restoration are we to adopt? Would you put in a partial plate? I certainly would not. As I see the matter no form of appliance is at all comparable to a shell crown on the first molar and a Carmichael attachment on the cuspid. Or, if the bite is very close, I would devitalize the cuspid and make a cast inlay with a post in the nerve canal. Since the casting process has become so very common Carmichael attachments are easily and accurately made by that method.

In case a lateral has been lost, the central on the same side very badly decayed, and there is a cavity on the mesial side of the cuspid, what manner of restoration would you advise? A partial plate? I would not. I would put a crown on the central. To this I would attach the lateral with a small spur of iridio-platinum, resting in a depression made for it in a gold inlay, in the mesial surface of the cuspid. In this case I would make the bridge before making the inlay. Then when the bridge was completed the spur would make in the wax inlay a seat for itself accurate in size, shape and position. Surely no intelligent dentist can honestly criticize such a method of restoration or have the face to say that a small plate would be better.

In the lower jaw the first molar is very frequently lost. The second bicuspid is frequently a close second. Now, if these two teeth be lost, what manner of restoration suggests itself? A partial plate? Not to me. I would put a shell crown on the molar and one on the first bicuspid, and to these I would attach an occlusal surface sufficiently strong and without any porcelain, leaving a clear space between the intermediate part of the bridge and the alveolar ridge, making what is usually spoken of as a hygienic bridge. In my estimation there is no other bridge at all comparable to this where the conditions will permit of its use.

If, then, bridge work is so desirable in so many places, why is it so unmercifully criticized? Because of the faulty preparation of the natural crowns, where shell crowns are to be adapted, and

the faulty preparation of the incisal ends of roots where bands are to be used. I need not dwell on this to a number of men who have been in practice for years. To properly prepare a natural crown or root to receive a band that will fit accurately is no child's play. It requires skill, patience and courage of a high order, and an appreciation of values on the part of our patients that, to say the least, is not very common. I will not go into details concerning such preparation. There is abundance of literature on the subject, and I would say to the busy general practitioner, "no time spent will be so profitable as the time spent in carefully studying this subject."

Let me suggest another field of study. To recent graduates I would say, "review your dental anatomy." To the men who graduated before dental anatomy was taught in a definite manner I would say, "study carefully Black's Dental Anatomy." For this I wish to say in conclusion, "No man can hope to do prosthetic dentistry, either crown or bridge work or the making of artificial dentures as they should be made and as they will be made in the near future, who has not a working knowledge of dental anatomy and the mandibular movements of the temporo-maxillary joint."

ELECTRICITY IN DENTISTRY.

By J. W. LEIGHTON,

A Graduate of the University of Toronto in Electrical Engineering.

There are several points worthy of notice in the analytical construction of a lathe for efficiency, reliability and economy.

1. The shaft should be conveniently situated near the table so that the latter may be used to steady the arms of the operator while grinding. This also has the advantage of making the motor more rigid; the farther away the centre of rotation is from the table the easier it is to tip the motor. For this reason, too, the legs should be spread as much as possible.

2. To obtain good results the stones should run true. This depends upon three conditions.

(a) The shaft and bearings should be of such a fit that there is no shake. Where there is play or shake in the spindle of a grinder it is impossible to get true or neat work.

(b) The chucks should be so designed that they will run true when placed in different positions on the shaft. This cannot be obtained by means of screwed chucks, they should be tapered fits, that is, the ends of the shaft should be tapered and the chucks reamed tapered.

(c) There should be a sufficient number of chucks so that when a stone is trued up it should never be removed from the chuck.

3. When a tapered fit is used in the holding of a chuck, some

method must be employed to release it. There are 2 in general use.

(a) By means of a knurled nut which, when screwed forward, shoves the chuck off.

(b) By means of a lever hung below the bearing having a fork projecting upwards behind the chuck.

On an examination of both of these types, after being in operation several years, it will be found that the fork shows marked signs of wear, while the knurled nuts do not show any. This is due to the small contact surface offered by the fork; and in many instances the wear is so great that the lever will no longer release the chucks.

4. The life of a motor depends largely upon the wearing qualities of its frictional parts: wear means friction, and friction varies greatly and depends upon the following conditions:

(a) The metals that rub together.

(b) Method of lubrication.

(c) Absence of grit or other foreign matter.

The bearings, according to the latest scientific practice, should be composed of two different metals. The shaft or rotating part should be composed of a fine, close-grain tool steel, while the bearings should be composed of a metal slightly softer in quality, one having a dense, oily composition such as Tobin or phosphor bronze.

The bearings should be of liberal proportions and pressure should not exceed 75 pounds per square inch on the projected surface. According to standard practice, the length should equal at least five times the diameter.

It is essential to have the shaft absolutely round, and grinding is necessary to insure this.

The clearance between the bearing and shaft should be sufficient only to allow the shaft to float on a filament of oil. Bearings that have been properly made and of good materials will last a long time if given ordinary attention, but imperfect bearings, such as those of the cheap induction type, will soon wear and rattle.

There are two methods of lubrication in general use. One from an oil cup placed above the shaft, and the other from an oil cup placed below. Upon careful investigation it will be found that where oil is fed from the top of the shaft more oil is required owing to the fact that the oil feeds out more readily and works out at the end of the bearings. On the other hand, oil fed through a wick from below just supplies the correct amount. This is very important since most of the trouble is primarily bearing trouble.

SPEED CONTROL.

There are three methods used to obtain speed variation:

(a) By having resistance in series with the armature.

(b) By changing the strength of the magnetic fields.

(c) By using a mechanical governor.

Of the first two methods method (a) gives the best results, for,

by weakening the magnetic fields as in (b) a motor will race more or less and not develop power.

Method (c) has been in use for several years and, as far as constructive details are concerned, it has proven entirely satisfactory.

It is self-evident that a centrifugal governor will maintain the speed for which it is set up to the loading of the motor to its full capacity, and this is the condition which gives the best results.

The foregoing are a few of the essential details in motor design and the cheaper grades of dental lathes are sadly lacking in these respects.

Alternating current lathes are divided into two distinct classes. The series wound armature type, to which class the high grade dental lathe belongs, and the induction type, to which belongs the cheaper commercial polishing motor. The former is recognized by its quiet running and greater number of speeds; the latter is seldom quiet even when new, and has only two speeds at the most.

PRINCIPLE OF THE INDUCTION MOTOR.

It is difficult to explain fully in this limited amount of space all the features of an induction motor, suffice it is to say, however,

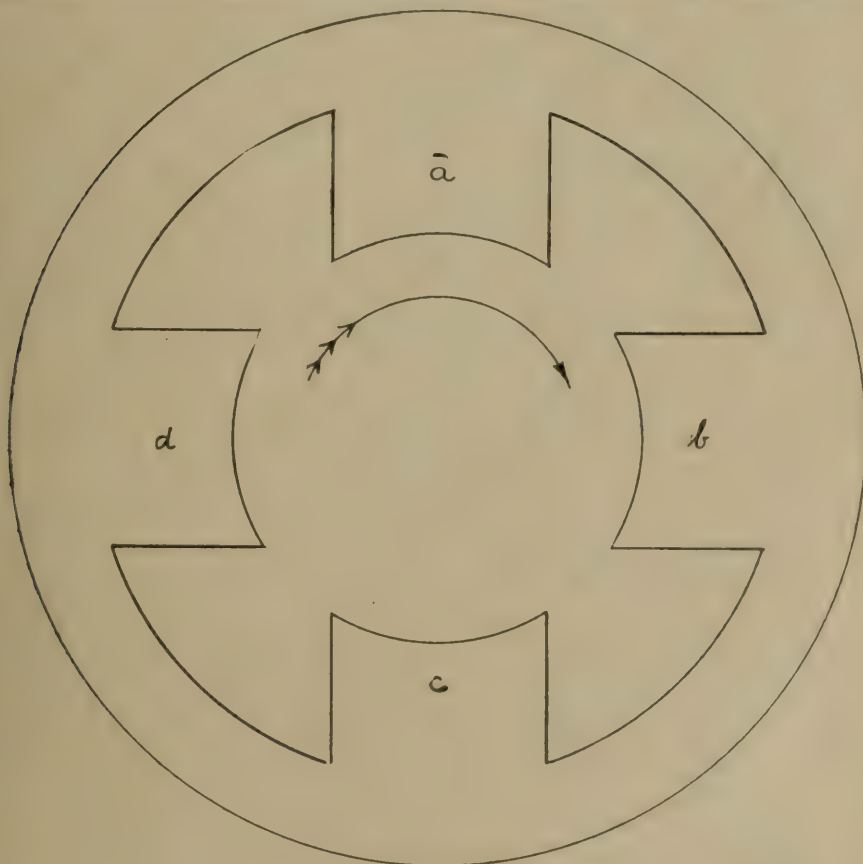


DIAGRAM OF INDUCTION MOTOR

that the distinguishing feature of an induction motor is the rotating magnetic field. In previous chapters the principal functions of

alternating current were explained. The current during a cycle of action rapidly rises from zero to a maximum, falls to zero, reverses its direction, attains a maximum in the new direction, and again returns to zero. During the progress of a cycle magnetism is so changed in the fields that the same attractive force appears at a in the accompanying diagram, and during successive instances at b, c, d, etc., setting up a magnetic revolving motion.

A piece of iron located in a central position relative to these poles, and if supported in bearings will revolve at the speed of magnetization or at a speed to correspond to the speed of the current, i.e., the number of cycles per second. The only method of varying the speed of an induction motor is to wind it with two sets of field coils, doubling or halving the number of revolutions per minute. The armature is pierced with heavy wires or bars to carry the induced currents. Seven or eight times as great a starting current is required as is required to run the motor ordinarily.

The following is a classified list of best known makes of dental motors:

SERIES WOUND TYPE.

Electro-Dental.

Ritter.

Leighton-Jacks.

INDUCTION TYPE.

Emerson.

Victor.

Westinghouse.

In the following issue the electrical mouth instruments will be discussed.

**CANADIAN ORAL PROPHYLACTIC ASSOCIATION—
PRESIDENT'S ADDRESS.**

ANDREW J. McDONAGH, D D.S., L.D.S.

Gentlemen,—

Once more your Directors are offering an account of their stewardship.

A year ago we presented you with an account of what had been done in the year past and forecasted what might be expected to occur in certain directions in the year just ended. It has been the lot of your Directors ever since the organization of the Society to have a good deal of up-hill work and to have opposition presenting itself from many different quarters; nevertheless we have tried to carry out your mandate and to further the objects of the Canadian Oral Prophylactic Association to the best of our ability.

We have had in the past a great deal of trouble with the manufacture of our products and the distribution thereof.

Since our last meeting we have transferred the manufacture of our powder and paste to another firm and you will see by the result the change has been very much for the better—Lyman Bros., Ltd., are now the manufacturers, their contract holding for five years and if we are pleased with them, as I have no doubt we will be, the contract may be renewed for another five years. Since they have taken over the manufacture we have had no more complaints of the paste getting hard, and, as you will see, during that period the sales have more than doubled, as the number of seals being supplied will show, and this notwithstanding the fact that Lyman Bros. could not get the material with which to turn out the product for some time after the former manufacturer had notice to cease—although he continued to supply the dealers after his contract had been cancelled and until we warned him through our solicitor that if he continued to do so we would have to bring action against him in the courts.

We also warned the druggists against buying any more of his products sold under the name of Hutax without our sanction.

A great many brushes have been sold, as you will see, by the Secretary's report, but a great many more would have been sold if they had been pushed more vigorously by the wholesaler and by the dentist. The Executive for the incoming year will have to make a move along this line. In order to save the school children from having to use a tooth brush totally unfit for their use and also to teach them the proper kind of tooth brush to use, we have in the last year paid one-half the loss on 2,000 brushes, so that they might be sold to the children at 5 cents each. Mr. Hargrave, the manufacturers' agent, paying the other half of the loss.

You who are charter members of the C. O. P. A. must realize

that what we anticipated when this Association was first formed is now rapidly coming to pass, that is, a wave of dental education for the public combined with a philanthropic movement which bids fair to encompass the whole of the Dominion of Canada and do more good for this great young country than any one thing which has ever happened for the welfare of humanity.

It is and has been our policy to help this movement along and we feel that you would desire that we sacrifice ourselves and our pride, if necessary, in this cause. We have done so and we feel that there is not a man in the Association who would not do so if necessary.

It is also our policy to help every other Society with the same objects in view, no matter where situated in the Dominion.

In the past year we have distributed 35,000 pamphlets to people of the educated class all over the Dominion and have exhausted our supply—the last 1,800 of which Dr. Thompson, of Nova Scotia, received and has promised to distribute in that province.

We believe this pamphlet would be better illustrated, and we are at the present having cuts made for that purpose, slides of which, as well as other slides in the possession of the Secretary, will be thrown on the screen to-night by Dr. Webster. We also have charts to be used when a lantern is not available. Some of the newspapers have been very kind in their notices of our Society, particularly "The Mail and Empire" and "The Globe."

We bought 600 copies of one issue of The Mail and Empire containing an article on the work of the Canadian Oral Prophylactic Association and sent them all over the country wherever we thought they would do most good. A great many papers copied the article. We also sent out 1,500 letters to the Drug Trade and a letter enclosing last year's President's address, Hutax pads, etc., to all the dentists in the Dominion.

Your Executive are pleased to report that they have been requested to supply the Government with an exhibit to be placed in the car which carries the tuberculosis exhibit and we have started to prepare the same, part of which will be shown to-night. We have the honor, also, of telling you that the Journal of Public Health of the Dominion, through its editor, Dr. Anderson, has requested us to furnish it with a series of articles relating to dental subjects, and we have been pleased to comply.

For that purpose a committee of members of the C. O. P. A. has been formed, comprising the following gentlemen: Dr. Webster, Editor in Chief; Dr. Doherty, Dr. Rhind, Dr. Trotter, Dr. Black, Dr. Seccombe, Dr. W. E. Willmott, Dr. G. E. Grieve, Dr. A. J. McDonagh, Dr. A. Day, Dr. J. P. McLachlan.

These gentlemen have already started on their work and two articles have appeared in the Journal. Each month will contain one until every member of the committee has published either one or two articles.

It is the intention to have a reprint made of all the articles and to keep them for the benefit of any educational committee which may desire to use them.

The Elgin Dental Society, which has been doing a grand work for humanity as well as for our profession, engaged Dr. Dowd to give a popular lecture in St. Thomas to school teachers, pupils and the public, and in order to judge whether this lecture would suit our purpose, your president went to St. Thomas to hear him, accompanied by Dr. Webster, President of the Toronto Dental Society, the result of which was that the C. O. P. A. agreed to pay the expenses of Dr. Dowd if the Toronto Dental Society would bring him to Toronto for a similar lecture, which, of course, you know, was done. But you do not know, and no one can forecast, the good which will come of that lecture, or, rather, of those lectures, for he delivered two.

In conjunction with Dr. Dowd's lectures the Toronto Dental Society had a test examination of the mouths of the children of two of the public schools. The results of that examination were given to the Toronto Dental Society meeting on the night of Dr. Dowd's lecture and caused great interest.

The necessity for much of the detail work which we set out to do or see was done has been removed from your Executive by the energetic work of the Ontario Educational Society led by Dr. Secombe, chairman, and Dr. Reade, Secretary.

This committee has induced members of the profession in many towns and cities of Ontario to give lectures to nurses in training, teachers, and, in some cases, public lectures, and hope to do more of it. The Executive of the C. O. P. A. have furnished the money for this work and have turned over the work, as far as possible, to this committee.

What the Educational Committee is doing in Ontario, we hope to have Committees of all the provinces do in their separate Provinces in a short time, and we hope as our business grows that we will be able to help every Society to do works of education and charity, that are now impossible for the lack of funds. We know there are men in the profession willing to do their share in every Province and in every town, and we have faith in the future.

So many dentists have spoken kind words about Hutax and the C. O. P. A. that we could not in an address of this kind mention any names without mentioning all—excepting when mention has been made in the public press.

In this connection in the annual report of the Nova Scotia Dental Society, there is a very kind notice of our Association and our work showing that the dentists in that province appreciate what we are doing.

Dr. R. M. Armstrong, Ottawa, in a paper on "Oral Prophylaxis" read before the Eastern Ontario Dental Association in September last, says: "Your patient must be instructed in the proper

way to use the tooth brush, of which science, since the advent of the Hutax brush, none of us should be ignorant of. I am a great admirer of the Hutax brush and often when I have recommended it the patients have noticed much improvement in the condition of their teeth, due to its use."

Also at the annual meeting of the Dental Society of Quebec, Dr. Kelly in a paper on "Oral Hygiene" recommends our preparations and acknowledges the good that we are doing.

At the last meeting of the Dental Association of Western Canada a great deal of their proceedings were taken up by discussion of the C. O. P. A., its objects and products.

A resolution was passed at that meeting endorsing Hutax and a suggestion was made to the Boards of the several provinces that they enter into negotiations with us regarding the extending of our work in that district which extends from Fort William or Port Arthur to the Rocky Mountains, encompassing Manitoba, Alberta, and Saskatchewan.

It is gratifying to note the rapidity with which this movement is spreading. It is also pleasing to note that in New Brunswick the good work is being carried on, and we have had favorable comments from there. Under our direction Dr. C. A. Murray, of Moncton, has organized lectures to nurses which is a help to the other work being carried on in that province.

All these accomplishments and helps are made possible by the fact that we were appointed a committee to represent the Canadian Dental Association in educational matters, an honor which was re-affirmed at the meeting of the Canadian Dental Association last June, at which meeting your President, as Chairman of that committee, presented our report for the preceding two years, which was received and adopted.

In concluding this address and speaking as one of the Dental profession, I feel we have great cause for congratulation on the success of our work because this work has extended now so that it is no longer the interest alone of the Canadian Oral Prophylactic Association, but the interest of the dental profession at large, more than that, in fact, of the whole community of this great Dominion.

Some five or six years ago there was a committee formed for carrying on this educational programme in the United States by the National Dental Association, which is the most representative Dental Association in our neighboring Republic. This committee found that they needed funds, these funds they obtained from the dental manufacturers, and at first thought there was no harm in doing so, but experience showed them, as it must necessarily show every individual or society, that resort to such methods, that they could do nothing worse for the cause they so fondly hoped to aid.

Dr. Corley, who was chairman of that committee, in speaking of the matter, acknowledged that the idea which the manufacturer has in supplying the money and the idea of the true dentist who

has the good of the public at heart and the raising of the professional standard are as widely separated as the poles of the earth, and the idea which the public obtains from this arrangement was the worst possible to obtain.

As President for the past year, I want to thank all the members of the Association for the support they have given me, and I want particularly to thank the different members of the Board of Directors, and in thanking them, gentlemen, it is not so much for the work which might appear in this formal report as for the harmonious spirit which has been in evidence during the year and for the time which every member of the Executive has spent, outside of the hours (and they were many), which were used in the regular meetings of the Board of Directors.

We owe a great deal of the success to every member of the Association:

To Dr. Adams, our Vice-President,

To Dr. Broughton, our untiring Secretary,

To Dr. Walter Willmott, who has felt the work necessitated more time than he was able to spare.. However, we are pleased to say that Dr. Willmott has done about as much work since he left the Executive as we could expect him to do had he been on, although he did not have the necessity of attending meetings of the Board of Directors, and we presume he will continue to do so.

We were exceedingly sorry to lose the comradeship of Dr. Willmott at our meetings. Nevertheless we extend him thanks for his good work and good will. To fill his place we were fortunate in getting the consent of Dr. Trotter to act, and our thanks are due him for the work he has done since taking office.

And most assuredly we desire to thank Dr. Webster, who always has been willing to bear more than his share in the work of the Association.

Thanking you one and all, I remain, sincerely yours,

GOLD VERSUS SILICATE CEMENTS.

MARK G. McELHINNEY, D.D.S., Ottawa.

It is now nearing a half century since the great amalgam controversy occupied the attention and divided the opinions of the dental profession. The case was then "Gold versus Amalgam" as materials for permanent fillings, the cements then in use being generally considered as temporary filling materials only.

The oxy-phosphate cements to-day are outside of the present controversy but for a different reason from that which excluded them from the question in the older argument. These cements have long since made a good claim to be rated amongst permanent filling materials and have been admitted as such where, for various reasons, gold or silicate cement cannot be used.

Ultimately, gold failed to oust amalgam, or vice versa, but amalgam succeeded in placing itself upon a permanent footing as a most valuable aid in the salvation of teeth and remains to-day the most widely used filling material extant.

Gold had always been considered the first of all filling materials until a few years ago its position was threatened by the advent of the porcelain inlay. In the ceaseless search for the perfect material porcelain gave great promise, and in some hands, under certain favorable conditions, its excellence is unquestioned, but it failed in the majority of cases to equal gold in width of adaptability and permanence. The use of the porcelain inlay must ever be restricted on account of its cost and because so few dentists become complete masters of the art of its use.

For the reasons above given it is doubtful if the porcelain inlay ever attains universal adoption, although it may always hold its preference on the part of a select few.

Lately, across the horizon of our professional vision, a bright ray of promise is thrown by the discovery of the silicate cements and accumulating experience is fast making that promise good. It is not that the silicate cements are perfect, but that they offer an excellent filling at no greater cost than gold, with a wide adaptability and no technical requirements for insertion that cannot be mastered by the average practitioner.

Herein lies the genesis of the present controversy wherein the regal position of gold is threatened by an adversary which possesses so many good points that it bids fair to win out.

The many good qualities which made gold pre-eminent are too well known to require more than a passing recital. Its cost places it within reach of the average patient, it is clean and sufficiently sightly, it is very adaptable, its technique is within the range of the average operator, and it is probably the most permanent of filling materials.

The disadvantages of gold are, it is always noticeable on account of its color, its method of insertion tends to minute fractures in the tooth substance, its insertion is laborious to the operator and tedious and trying to the patient, and, lastly and most important, when it fails it fails in its contact with the walls of the cavity, allowing a long period of leakage before its fault is noticed and a consequent destruction of tooth tissue. Each successive replacement means a larger filling until the pulp is threatened and even destroyed.

Certainly, a good gold filling in a tooth of good structure may last a life-time, as many of them do, but an experience of over twenty years leads the writer to believe that such is the exception and not the rule.

It must be also borne in mind that the question is chiefly concerned with the filling of the anterior teeth where both appearance and permanency are prime requirements. In the filling of the posterior teeth, permanency is the great requirement, and the artistic side may be allowed to take second place.

The gold inlay is superior to the welded filling because its insertion is easier on the tooth; in its other points it is similar in appearance, adaptability and its separation from the cavity walls in the event of its failure.

One point which often escapes notice in considering the matter of permanency is that the chief requirement is the permanency of the tooth itself rather than of the material with which the tooth is filled. There are many cases where the repeated replacement of even ordinary cement will preserve a tooth throughout a longer period of usefulness than would the insertion of a more lasting material. The softer material wears out on the surface, leaving a protective covering on the cavity wall, while the harder material separates from the walls as a mass leaving them, for a time at least, subject to the action of decay.

The claims of the silicate cements are many and compelling. They offer artistic possibilities not exceeded even by the porcelain inlay. They can be adapted perfectly to the cavity walls. The labor entailed in their insertion is infinitely less than that of gold filling, and the patient has a proportionately easier time. Inserted in strict accordance with the requirements of the material, the silicate cement surely equals in permanency the average gold filling, and the cost to the patient is usually no more, and often less, than of a gold filling of equal size.

Lastly, in the event of failure, the loss is usually from the surface, so that the cavity walls remain intact. This is one of the most important points in the relative values of filling materials.

Since the advent of the silicates and the lapse of sufficient time to test their virtues many operators have ceased placing gold fillings in the anterior teeth, and this movement has not been amongst those who are willing to sacrifice everything to ease of operation, but

amongst those who have made it a rule to spare no effort which could conduce to the excellence of their services or the comfort of their patients.

Truly, the old tyrant gold has at last met with a worthy opponent and the signs of the times are that anterior gold fillings have lost their old-time warrant of professional favor.

Gold, the simple element, has reached its limit of excellence when chemistry has made it pure and the manufacturer has reached the limit of its possibilities, and that was long since.

The silicate cements are compounds, still subject to further improvement on the part of the chemist and the manufacturer.

In the future lie many possibilities with the hope that they yet may reach the nearest to the ideal material.

The king is not dead, but the sceptre is passing into other hands.

Selections

STERILIZATION OF AQUEOUS SOLUTIONS OF CHLORHYDRATE OF COCAIN.

The alterations which chlorhydrate of cocain in aqueous solution undergoes when being sterilized have been generally attributed to the effect of the heat and the alkalinity of the glass. Extensive tests with glasses of different alkalinity and various temperatures have yielded the following results: The decomposition of cocain is greater the greater the alkalinity of the glass. The heat has but a small influence. In receptacles of absolutely neutral material, such as cast silica, the cocain solution undergoes no alteration whatever, even in a temperature of 120 degrees C. Sterilization at 120 degrees C. in the autoclave has no harmful effect on solutions of chlorhydrate of cocain, if the alkalinity of the glass receptacle does not exceed that of 3 c.c. of centinormal soda to every 50 c.c. of capacity.—*Annales de Pharmacie*, per *Journ. Dentaire Belge*.

ANTIPYRIN DANGERS IN ODONTALGIA.

A note in the *Lancet* of the 9th ult. by G. D. H. Wallace, M.R.C.S.Eng., L.R.Q.P.Lond., D.P.H.Camb., Resident Surgeon, Birmingham General Dispensary, records that "a healthy-looking girl, aged 20, was brought to see me on April 2. She had been suffering from toothache, and on the advice of a friend had sent to a druggist for 10 gr. of antipyrin. Within fifteen minutes of taking it she complained of a feeling of faintness and suffocation, and her face became "blotchy" and swollen. When I saw her she was perspiring freely, the skin of the face and neck was œdematous, and there was a profuse urticarial eruption on the face, neck, and upper part of the chest. The pulse was 120, very soft, feeble, and irregular. The temperature was 95.5 degrees F. Whilst being examined she suddenly collapsed, her face became very cyanosed, and she lost consciousness. Brandy by the mouth and strychnine hypodermically were administered, and in the course of a few minutes she regained consciousness. She was put to bed, hot-water bottles applied, and a calomel powder given. Three hours

later the temperature had risen to 97 degrees, the pulse-rate was 90, and the œdema of the face and neck had markedly diminished. She was kept on a milk diet for two days, by which time the temperature had risen to normal and the swelling and urticaria had completely disappeared. There was no diarrhoea or vomiting throughout, and the case differed materially from cases of ptomaine poisoning. Its most marked features were the rapid onset and recovery, the low temperature, and the great prostration. The patient had never had a previous attack (she had never taken antipyrin before), and a careful inquiry failed to elicit a history of anything eaten which might have caused the symptoms."

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Dominion Dental Journal

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TORONTO, JANUARY 15, 1911

No. 1

THE UNIVERSITY OF MANITOBA.

The Manitoba legislature some time ago appointed a commission to investigate the whole problem of higher education. The report of the commission was not at all unanimous, and as a consequence no positive action has been taken by the Government. However, the Council of the University of Manitoba, has been offered free a magnificent site upon which they are now preparing to erect their buildings.

The dental profession of Manitoba are in close touch with the University Council, and each body has appointed a committee of conference, which will meet to discuss the establishment of a dental department. It is expected such a department will be established as soon as the University is organized under Government control.

Editorial Notes

Dr. McDonald, Yorkton, Sask., was in Toronto during the new year.

Dr. Garvin, of Winnipeg, visited Toronto and Hamilton during the Christmas holidays.

Dr. Herb. Baker, '06, now of Stratford, was a candidate for school trustee, but was defeated.

November 23rd, Miss Nemitz, Sandusky, Ohio, died of convulsions following tooth extraction.

Dr. T. E. Bennett, of St. Thomas, was a visitor at the meeting of the Toronto Dental Society in November.

Mrs. Andrew Hogg, Ironsides, P. Q., died shortly after the extraction of some teeth. Chloroform was administered.

An acute illness will delay tooth eruption, but the most frequent delay of dentition in the baby is rickets.

Dr. S. W. Bradley, of Richmond, Ontario, was married to Miss Bertha Mann, of Stittsville, December 10, 1910.

The Leighton and Jakes Dental Manufacturing Co., Toronto, will shortly place a dental chair on the Canadian market.

The annual meeting of the Canadian Oral Prophylactic Association was held at the St. Charles Restaurant, January 9, 1911.

A full report of the work of Dental Education of the public as undertaken in Rochester, appears in the St. Thomas Journal.

Nine candidates wrote on the British Columbia Dental Examinations held Nov. 28th. The examiners acting for the Board are Drs. O'Neil, Brigbouse, and Rutherford.

The Board of Directors of the Royal College of Dental Surgeons are arranging for a practitioners' course in modern dentistry to be held some time during the summer of 1911.

Dr. Baird, of Uxbridge, the only member of the Toronto Dental Society who lives outside of the city, reported the findings of the dental examiners to the local papers, which gave considerable space to the subject.

Many of the daily and weekly papers throughout Canada have given a good deal of space to reports of the condition of the teeth of the School Children in Toronto as shown by the examinations made by the Toronto Dental Society.

Members of the Staff of the Royal College of Dental Surgeons of Ontario who attended the recent meeting of the National Institute of Dental pedagogics—Dr. J. B. Willmott, W. E. Willmott, A. W. Thornton, A. E. Webster, C. Angus Kennedy, A. J. McDonagh.

The Ottawa Dipper says: Dr. V. H. Lyon, we remember, ran for School Trustee on the platform of proper dental examination a year or so ago. He was defeated by ignorant voters, and if you were one who stood against dental examination stop and think now what harm you did, not only your own children, but those of friends and neighbors. This question is bound to come up again—see that the weight of your word goes for dental examination.

The T. N. Clark Chair Co., of Toronto, has given up business. Its former manager, Mr. Clark, has become the Canadian Agent of the Ritter Dental Manufacturing Co., Rochester. The offices and show rooms are at 167 King St. West, Toronto, Canada. In these show rooms will be found all the manufactured goods of the Ritter Company, and many of the modern appliances of the A. C. Clark Co., Chicago, and the Lee Smith Company, of Pittsburg. The new ideas in office equipment are on exhibition.

In the municipal elections at Stratford, Dr. J. A. Bothwell was re-elected for

school trustee for a period of two years. He will by seniority this year become chairman of the Board. Dr. Bothwell has been faithful to his duties as a member of the Board, and his many friends congratulate him on his re-election, and on the good work he is doing along the lines of dental education and dental inspection in the schools of Stratford. We wish him every success this year as chairman of the Board.

Dr. T. C. Trigger, St. Thomas, reports the following as a direct result of the oral hygiene lecture recently given in St. Thomas, under the auspices of the Elgin Dental Society.

Inspector Taylor, of this city, who was authorized by the Board of Health of Dunwich to make a report as to the physical condition of the pupils of the township, stated in his report that it has been discovered by actual observation and examination that the cause of pupils being backward is largely due to some remedial or abnormal physical impediment. It is a conservative estimate to state that one-third of all the pupils who attend the public schools are deficient physically and thus hindered from healthy mental development. Mental development is greatly reduced by defective teeth, and the great train of evils that follow therefrom such as imperfect digestion, persistent headaches, general lassitude, etc. A large amount of dullness backwardness and apathy so common in many pupils is due largely to the presence of some defect in the eyes, ears, nose or throat. His observations of the schools of Dunwich have fully convinced him of the necessity of medical inspection. It would be a conservative estimate to state that 75 per cent. of all the pupils were suffering from defective teeth; of the presence of suspected adenoids there was abundant evidence; some pupils were dull in hearing, and not a few had defective eyesight.

The report suggested that Dunwich and Aldborough jointly defray the small expense incidental to the medical inspection of the pupils at least once a year for any physical defect that would retard their progress at school and would report such

defect to the parents; or if the municipalities should decline to meet the cost of such inspection, the co-operation of the teachers might be enlisted, who could be instructed as to their duties by some medical inspector, and thus detect the defects in the pupils referred to, and notify the parents, who could consult the family physician.

The late Dr. Frederick N. Harvey, London, Ont., died suddenly Monday, September 26th, 1910. About two years ago Dr. Harvey suffered a severe attack of paralysis,



since which time he has not been in active practice. Dr. Harvey practised in London about twenty years. Previous to going to London he lived in Toronto.

After a perusal of Dental, Pharmaceutical, Medical and Public Health Journals, one is almost afraid to live lest he die. To breathe is highly dangerous, for the common house, office and street dust is laden with disease germs which cause many deaths yearly. The water we drink is often impure and disease producing; even bossy's milk becomes contaminated; the public drinking cups in railway trains and at drinking fountains are beset with danger;

the house fly crawling upon our food leaves a trail of disease and death. Besides all this, our own mouths are just hot beds wherein breed germs by the million. Food clinging to our teeth ripens into germs, decayed teeth exude pus which is swept into the stomach with food and drink—and so we are poisoned even though the food and drink themselves be pure. The great wonder is that any of us is alive.—or so it appears when we have finished reading. Doubtless our way through life is beset with danger and death on every hand. We ought to be thankful that the path of life of the twentieth century has so many sign posts to warn and admonish. Those who are devoting their knowledge and skill to devising means for preventing the spread of disease, and for prolonging life, are saviours of the race.—Whitby Gazette.

DENTISTS ELECTED.

Some of the Dentists of Ontario who have been elected to municipal offices at the recent elections—Drs. Sihler, Mayor, Simcoe; Clemes, Councillor, Collingwood; Sprott, Councillor, Barrie; Colter, Councillor, Sarnia; Baird, Councillor, Uxbridge; Revel, Councillor, Woodstock; Hilliard, Water and Light Commission, Waterloo; Morrison, School Board, Peterboro; Robb, School Trustee, Niagara Falls; Wykoff, School Trustee, London; Ballachey, School Trustee, Brantford; Bothwell, School Trustee, Stratford; Burns, School Trustee, St. Thomas; Honsinger, School Trustee, St. Thomas; Richardson, School Trustee, Barrie; Ellis, School Trustee, Bradford; Conboy, Board of Education, Toronto.

A PROPHYLAXIS TREATMENT.

The last prophylactic treatment is that profession by Dr. Smith. The operation is by no means a complete one, as the only requirements are a piece of orange-wood flattened at one end, some medium fine pumice and a knowledge of what is required to be done.

Place some pumice on the flattened side of the orange-wood stick and rub each and

every surface of each and every tooth thoroughly. At first the stick will slide along the tooth because of dirt on the surfaces of the teeth and perhaps because the dental plaque had formed to protect the germs while the tooth tissue is dissolved. These must be removed and their disappearance will be shown when the pumice begins to grate on the enamel. Every surface must be thoroughly gone over, pits and fissures and the proximal surfaces below the contact point, and also the gingival being the places where most care is to be taken because of the tendency of the tooth to decay at these points. This treatment should be administered about once a month because more frequent administration would wear away the enamel. Sulpho-cyanide may be administered by the mouth to make up for the lack of it in the saliva.

A GOLD INLAY RETAINED FOR ALMOST THREE YEARS WITHOUT CEMENT.

By W. H. Doherty, D.D.S., Toronto, Canada.

What is perhaps an unique experience in gold inlay work is contained in the following account of a case from practice.

In October, 1908, a gold inlay was placed in an upper bicuspid. The cavity was a shallow mesial one. The sulcus or the occlusal being practically obliterated by wear, no step was made, but a simple slot-shaped, dovetailed preparation through to the occlusal, the inlay slipping to place from that surface.

On tapping the inlay to place and bur-nishing the margins, all attempts to remove it for cementing were unsuccessful, and it was decided to leave it as it was, without cement and watch developments. Although seen at intervals during the following two years no traces of disintegration or discoloration were discovered. Finally in November, 1910, the patient reported that he thought it was loose. On removal it was found that the cavity walls were perfectly sound with the slight exception of just a trace of softening in each

dovetail; just enough apparently to have loosened the inlay. After scraping this off, and without further preparation, the inlay was cemented to place with as perfect margins and general results as originally.

That this inlay, placed in a wet cavity,

without cement, remained for two years and 8 months without caries resulting, would seem to indicate the remarkable preservative qualities of the gold inlay where a satisfactory fit and margins have been obtained.



A. T. SIHLER, D.D.S.
Mayor of Simcoe, 1911.

Proceedings of Dental Societies

DENTAL SOCIETY OF WESTERN CANADA.

The Dental Society of Western Canada will meet in Winnipeg, on April 24 and 25, 1911. The executive have been successful in securing two prominent dentists to take part in the meeting, Thomas B. Hartzel, of Minneapolis, and W. E. Cummer, of Toronto. The subjects to be discussed will be Pyorrhea, Prophylaxis, and some neglected features in Prosthetic Dentistry. Other essays and clinicians will be announced later.

OFFICERS OF THE DENTAL PEDAGOGICS.

President—D. M. Gallie, Chicago.

Vice-President—H. E. Friesell, Pittsburg.

Sec.-Treas.—F. Gethro, Chicago.

Executive Board—D. H. Squire, B. E. Lischer, H. M. Semans.

Commission on Textbooks—A. E. Webster, H. E. Friesell, Ellison Helliar.

Commission on Dental Nomenclature — S. H. Guilford, T. W. Brophy, J. B. Willmott.

OFFICERS OF THE NATIONAL DENTAL ASSOCIATION.

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John W. David, Vice President, South Corsicana, Texas.

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Homer C. Brown, Rec. Secretary, 185 East State St., Columbus, Ohio.

Arthur R. Melendy, Treasurer, Deaderick Bldg., Knoxville, Tenn.

The fifteenth annual session will be held in Cleveland, Ohio, July 25 to 28, 1911.

HAMILTON DENTAL SOCIETY.

Reported by Dr. K. Kappelle.

The monthly meeting of the Hamilton Dental Society was held on Monday evening, December 12th, at the Tudor Inn.

President Lester occupied the chair and there was a large turnout of members to greet Dr. Roberts, Medical Health Officer who was the speaker of the evening.

It was decided to appoint the Dominion Dental Journal official organ of the Society.

The Educational and program committees were authorized to complete arrangements for a public lecture, to be held in January.

Dr. Roberts spoke on the past and future of preventive medicine, which proved very interesting discourse, and convinced those present that they had listened to a man of broad thought and possessing much knowledge of the work in which he is engaged.

RESOLUTION PASSED BY NATIONAL DENTAL ASSOCIATION.

Resolved that it is the conviction of the National Dental Journal that the Metric System shall become the accepted standard of weights and measures in all professional and commercial transactions.

To accomplish this purpose at as early a date as may be practicable it is urged that all physicians, dentists, druggists and dealers in precious metals be urged to put into practice this system of weights and measures at once.

It is further resolved that this resolution be published with the proceedings of the Society, and a copy sent to all the Dental Journals and to the Secretary of the U. S. Pharmaceutical Convention, Dr. Murray Galt Motter, 1841 Summit Place, Washington, D. C.

Dominion Dental Journal

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No. 2

Original Communications

THE PREVENTION AND TREATMENT OF ROOT CANAL INFECTIONS AND ASSOCIATED LESIONS.

BY DON. M. GRAHAM, M.D., D.D.S., DETROIT, MICH.

Read before the Toronto Dental Society, January 24, 1911.

In accepting your very kind invitation, it was with the understanding that I be permitted to present a very short paper, that the major part of the time might be given over to stereopticon. However, "Root Canal Infections and Associated Lesions: Their Prevention and Treatment," is so broad a subject that I am compelled at the outset to write somewhat lengthily to even superficially cover the subject. The truth is, this subject could be divided into half a dozen papers, any one of which is of sufficient importance to demand an evening's consideration.

If any one has come to the meeting hoping to hear some new abscess cure,—some mummifier or embalmer, some short cut root canal treatment,—he will, I fear, be sadly disappointed, for it is the opinion of the writer that nothing short of sterilization and complete obliteration of canal will suffice for a permanent root canal treatment. This paper will present nothing that is particularly new, but it is its purpose to call attention to the great value of many simple prophylactic measures, which are often overlooked, as well as emphasize the necessity of complete and thorough sterilization of canal contents when infection has intervened, and the replacement of same with some non-absorbable, impervious root canal material, if we are to do our whole duty to our patients and save them from some very serious consequences. We are all familiar with the dentist who is constantly treating abscesses, necroses, etc, while another with like clientele consumes very little of his time in the treatment of these conditions. The reason is simple. The one realizes the value of prophylaxis in preventing and thoroughness in treating infections; the other

mechanically repairs breaks in the continuity of the dental organs without any regard to physiology or therapeutics and, when sepsis has occurred, deals with it empirically or ineffectually.

When we remember that the great majority of abscesses, necroses, fistulae, as well as a great many antral empyemas, are the result of root canal infections, it would seem reasonable that the question of prevention should receive our first and most careful consideration. It is impossible to enumerate and discuss all, or even the majority of prophylactic measures that can be profitably employed, but if we are to render our patients the best possible service, it is certain that we must insist on frequent visits, that the first evidence of the pathologic may be detected and corrected.

Mal-occlusions and all forms of pericementitis should receive our intelligent and thoughtful attention. All evidences of thermal stimulation should be inquired into, as well as all abnormal sensations, that early treatment may be instituted and subsequent troubles thereby averted.

A systematic and careful search should be made for caries, and when found, these cavities should be filled. Perhaps there is no more pernicious habit than that of allowing a cavity to get a little larger before repair is attempted. Many pulps have been needlessly sacrificed from this practice, and many abscesses and necroses have followed from this neglect. When cavities are found it is the belief of the writer that it is almost mal-practice to restore the tooth with a metallic filling without an intermediate non-conductor. There is so much to be gained by such a procedure, that it would seem the part of wisdom to make this the invariable rule. With shallow cavities, a quick setting oxyphosphate or oxychloride of zinc mixed to moderate stiffness is all that is necessary. With the deeper cavities, the pulpal walls should first be painted with some non-conducting varnish, or cholapercha and iodoform.

With the aid of an assistant, the routine practice of lining all cavities will consume but a very few minutes, and by this method we have also the great advantage of hermetically sealing the cavity as well as preventing sudden thermal changes. Large inlays should always be cast hollow when prepared for vital teeth, for the same reason.

When any doubts are entertained as to the future welfare of the pulp, it is safer to devitalize. Teeth that have to withstand stress in carrying bridges, and especially if bell-shaped, are much safer devitalized. Teeth in an advanced stage of pyorrhea should also be devitalized, as well as treated along approved prophylactic methods, if we are to do efficient preventive work.

Faulty cementation of dowels and shell crowns is another source of infection. In a highly dehydrated canal, it is most difficult, and sometimes impossible, to perfectly cement a dowel, as the cement rolls upon itself and withdraws with the canal filler, leaving air spaces. With a canal somewhat moist, a cement of proper con-

sistency can be painted on the walls and forced to every part of it. The dowel should next be carefully smeared before cemented into place. It not infrequently happens that in an abscessed root, carrying a porcelain crown of recent construction, a fine broach can be forced to the apex after the crown has been removed. This would be impossible with proper cementation, which insures permanency of dowel, as well as exclusion of oral infection. Even with well-fitting shell crowns, the best results are gotten by having the tooth not too dry and painting it with cement, which will form a union with the cement in the shell.

Many other preventive measures might here be mentioned, but time will not permit their enumeration, but the filling of teeth without due regard for the integrity of the pulp, or the filling of pulpless teeth without proper removal of canal contents, and its replacement with a suitable canal filling, is undoubtedly responsible for most of our alveolar abscesses and associated lesions. Nor should we forget the danger of infected broaches. Indeed, all instruments coming in contact with living tissue should be sterilized, preferably by boiling. Chemical sterilization is a delusion and a snare, and it is now known that albuminous coatings will effectually protect germs and their spores from any germicide we may employ. Regular boiling of broaches in a solution of carbonate of soda for ten or fifteen minutes, would reduce wonderfully the number of teeth, which become sore and often abscessed in the course of pulp extirpation.

The canals that will give us the most trouble are undoubtedly the constricted, tortuous ones, and these are found mostly in buccal upper molar roots, and mesial lower molar roots, while secondary dentine and pulp nodules and other abnormalities will increase the difficulty of the work, no matter in what tooth these may be found. The pulp thoroughly devitalized or desensitized, we are prepared to extirpate it. Sufficient tooth substance should be removed to permit a broach to enter in line with the root canal. It is worse than folly to attempt, as is so often done, the removal of mesial pulp filaments through a distal approximal cavity or a small occlusal opening. A good rule to follow in the removal of filaments in small canals, is to open sufficiently until the entrance to that canal can be seen. Tooth substance can always be replaced by an indestructible material.

It is often impossible in these constricted canals to pass to the apex the finest barbed broach, and to persist in its use is an extremely hazardous undertaking. It is much safer and better to proceed with fine, straight broaches, which can be made by cutting the barbed portions off our ordinary ones. By bending at a short angle, considerable force can be applied, and entrance gained, when progress can be made by carefully working into the canal. If there yet remains live filaments, phenol, or phenol and cocaine can be employed to good advantage, and as distance is gained, other

broaches of longer angles and larger diameter may be used. By persistent and intelligent effort, very few, indeed, are the roots whose apices cannot be reached, and right here we might add, that very indifferent results are to be expected of the practitioner who fails to demand a fair remuneration for this expenditure of time and effort. If the canals are difficult of entrance, sulphuric acid can be used to dissolve the organic matter. Spiral twist hand broaches can be used to enlarge, as can also a good quality of barbed broach. It is exceedingly dangerous practice to use any form of engine reamer in these small roots, for the hand piece unavoidably obstructs the view, with the result that many roots are perforated. With our best efforts, some canals are anatomically impossible of complete cleaning, while we have sometimes the misfortune of breaking a broach, which prevents further advance. Then we are compelled to make the best of an unfortunate situation, and one on which there seems to be no agreement. Some will use mumifying material, some a strong antiseptic, with the hope of preventing future trouble. It is most fortunate in these constricted and tortuous canals that if any considerable length be recovered they will remain quiescent. They should, nevertheless, be treated expectually, and so recorded, that later, if trouble arises, the root can be amputated if it is deemed advisable. Great care should be exercised in the treatment of gangrenous or abscessed pulps lest toxins or infection be forced into apical tissues. It not infrequently happens, that in multi-rooted teeth we have a gangrenous or putrescent condition in one canal, while in another we have a live filament. Caution is demanded here, as in all septic conditions, in neutralizing these products, when the vital canal can be treated as if it were in a single rooted tooth. With canals sufficiently large and aseptic, we are prepared for our root canal fillings.

If we are to consider a successfully filled root canal, one that is permanently and hermetically sealed at its apical foramen, without any impingement on apical tissues, we would doubtless find very few perfectly filled canals, as it is almost mechanically impossible to always, or even generally, fill to the apex only. It is also a question if it is possible, with the materials at hand, to hermetically seal a canal even outside of the mouth. But Nature is ever kind and co-operative in her efforts, if we do not ask too much of her. The apical tissues, we know from experience, will take care of considerable effusion, and not a little infection, if the bodily forces are in good repair. This co-operation and tolerance has led to the exploiting of all kinds of short-cut-root-canal treatments, mummifying pastes, medicated cotton and powders, paraffin, etc., have been used, and because teeth so treated have remained fairly comfortable for varying lengths of time, their merits have been lauded to the skies. The fact is, the majority of teeth will remain comfortable for varying lengths of time with 'any old

thing" as a root canal filling. That mummifying pastes are scientifically wrong will be conceded, I believe, by all careful investigators. The shrinkage of nerve filaments will permit of effusions from apical tissue, and infection from intrinsic or extrinsic sources. The larger the canals the more room for infection, and happily the smaller and most difficult ones to fill, the least liable to give after trouble. Besides, recurrence of decay into pulpal chamber would result in dilution and disintegration of the mummifying agents, and permit easy access of infective products. Medicated powders and cottons can never be more than temporary treatments for root canals, as the drugs must necessarily dissipate themselves in time, and the apical fluids will dilute and disintegrate these materials, leaving a vulnerable zone for infection. Paraffin in contact with tissue fluids becomes softened and absorbed, so that it would appear that there has been no distinct advance in recent years in the matter of root canal materials.

A root canal filling, in order to be serviceable, must be non-irritating and non-absorbable. It should also be capable of easy insertion and removal. Gutta-percha possesses in a high degree all these qualities. Dissolved in chloroform or eucalyptol, it can be comparatively easily inserted, and by the same drugs its removal is not difficult if occasion demands it. It can be said to be non-absorbable, and although not by any means non-irritating, the tissues tolerate it fairly well,—sometimes even when a small piece extrudes beyond the foramen. Too much, however, has been said in its favor in this regard.

While it is true that many of these canals, even with the greatest care, cannot be filled completely or perfectly, yet they can be filled so completely that any inequalities will be taken care of by the tissues, and we can feel reasonably sure of a useful and comfortable tooth if these precautions are taken.

The cases that give us the greatest trouble are the ones that present with putrescent or abscessed conditions. Until very recently, the putrescent canal gave us much cause for alarm, but with the advance in dental therapeutics, in recent years, we can view with complacency the uncomplicated putrescent tooth. With the formo-cresol treatment of Buckley, we can generally put the putrescent canal in an aseptic condition in as short a time, and with as little effort as we can devitalize and remove the nerve filament from a healthy tooth. Of course, great care must be exercised in dealing with putrescent conditions. The pulp chamber must be carefully opened, and without disturbing the canal contents a treatment of formo-cresol sealed into it. This is allowed to remain a few days. On the second visit the canal contents can be carefully removed and another treatment sealed into it. In the majority of cases, three or four treatments will put the canal in an aseptic condition, and ready to receive the canal filling.

Where infection has already invaded the apical tissues, we

have quite a different problem to solve. With these tissues in the first stage of inflammation, that is, where we have inflammatory products, but as yet no pus, our treatment should be sedative and abortive. Opening into pulp chamber and permitting the escape of gases, blood or pus, will do much in relieving pain and absorbing the inflammatory condition of apical tissues. An anodyne treatment to a highly congested pulp for twenty-four hours will permit of its successful devitalization by arsenic. Counter-irritants in the form of Tr. Iodine or Tr. Aconite and Iodine will be found useful. If resolution is to take place, the pain will subside and the tooth can be treated, as for uncomplicated pulpitis. If, however, resolution does not take place and the pericementum and pericemental tissues become involved, we have a situation which is most trying for the patient as well as the operator.

Most of us will hesitate, in the presence of a septic canal, to attempt to reach the infected apical zone with a broach, yet since we have already infection here, it is generally best to gain access to the pus sac and evacuate its contents, if possible, into canal. The abortive treatment should still be kept up with the idea of relieving pain. Counter irritants in the form of tr. iodine, hot water or capsicum plasters can be used to hasten the termination, if we cannot relieve the pain. If the pain still persists, Dover's powders, magnesium sulphate, and even morphine may be administered, or we may anticipate the natural evacuation of the inflammatory product by making an artificial fistula after locating, as accurately as we can, the infected area and direction of the pus. When any considerable area of the apical tissues have become liquefied it is generally best to curette, that granulation may readily and safely begin. With the evacuation of the pus and the subsidence of the pain, the canal should be put in an aseptic condition and filled as soon as possible. In cases of acute pericemental abscesses, amputations are rarely demanded, but in chronic cases, where the inflammatory products have liquefied the apical zone, leaving a considerable length of denuded, resorbed root, the only scientific procedure is early and thorough amputation into healthy tissue; when healthy granulations will effectually repair the damage under appropriate after-treatment. In multi-rooted teeth, one root can be sacrificed, when the tooth can be expected to give good service for a number of years.

Mesial roots of lower molars are sometimes beyond redemption, and often with so large a perforation in the bifurcation that we are tempted to sacrifice the whole tooth. If the distal root be in a healthy condition, the mesial root can be extracted and a useful crown constructed for the remaining one, which will render good service for a great many years. Sometimes the mesial root can be made to do service in like manner.

Perforations of roots are not pleasant things to contemplate, yet these can often be restored to usefulness if we give them the

same care and consideration we apply to some other branches of our work. It is the custom of many to repair these perforations with gutta-percha, but it has been the experience of the writer that gutta-percha is not entirely non-irritating, and he has found amalgam to be superior in these cases. Copper amalgam can be used and inserted by a suitable instrument, after apical part of canal has been filled and pericemental tissue pressed out of cavity, but an ordinary quick setting amalgam made rather plastic and pressed in position with suitable instrument, seems to give better results. Where it is possible, it is advisable to first place a strip of tin to be followed by the amalgam. This seems to permit of a smoother surface and is therefore less irritating to the tissues.

The vast majority of alveolar fistulae are the result of infected root canals, which, when made aseptic and filled will permit healthy granulations to repair the damage. The injection of phenol in cases of tardy repair, is generally followed by happy results. When they present on the face, they are most disconcerting, especially if we have had the patient under treatment before the abscess presented in this position. Such a fistula will not heal until the cause is removed, and will continue to infect and destroy the reformed granulation tissue. Until this focus of infection be obliterated by proper treatment, we shall have a fistula which defies all attempts at treatment, save that of root canal sterilization and filling, when the unmolested granulation cells will soon obliterate the fistula.

When such a fistula has been of long-standing, we have quite a disfigurement, which may well claim our earnest attention from a cosmetic standpoint. By dissecting out the fibrous tract and bringing the fresh edges of the wound into proximity with each other by means of approximation and retention sutures, the effacement of the disfiguring scar can generally be accomplished to the satisfaction of the patient and operator. With very old scars which have much fibrous tissue, we can hope only to ameliorate this condition, and in any case, it is to be remembered, that there will remain evidences of some scar tissue, which will result from the artificial wound.

A chronic alveo-dental-abscess is potentially also an alveolar necrotic process, and of all alveolar necrotic conditions, by far the most numerous are those of dental origin. In the treatment of alveolar fistulae, therefore, an infected root canal or apical infection should be suspected. With the advent of radiography, there is little excuse for experimentation, for in the vast majority of cases an imperfectly filled canal, an extruding root filling, or a resorbed root, together with the area involved, can be quite distinctly outlined on the skiagraph. In no department of the healing art is there so little excuse for treating empirically, as in the treatment of alveolar dental lesions. Pericemental abscesses do not rightly call for consideration here, neither can we discuss here syphilitic, tuber-

culous or phosphorus necrosis, except to say that these should always be borne in mind in making a diagnosis. Nor have we the time to give in detail the treatment of these often troublesome conditions. Suffice it to say that with the cause removed, nature will reward our efforts speedily and handsomely. If diseased root be the cause, we must direct our attention to it, and treat along approved lines, sterilizing and filling canal, amputating or even extracting it if necessary.

In amputating roots and curetting bone tissue, we should prevent pain by the employment of a local anesthetic, with which nearly all operations about the jaw may be performed painlessly. Cocaine is a standard local anesthetic, but its employment is not without danger. Quinine and urea hydrochlorate is slower, more painful, but safer in its action, and one that has been used with considerable satisfaction by the writer for some time. Good surgery demands that we have strict regard for asepsis, that our operation be thorough, and in these cases, that no necrotic or carious tissue be left. Cutting well into healthy tissue is nearly always a wise precaution. Roots should be smoothly amputated and on a level, or even slightly below healthy alveolar tissue, if we are to get the best results. With a sharp bistoury the soft tissues should be cut sufficiently to permit opening through the process, that root may be seen, when apical portion can be removed by a bur and smoothed by small stones. A mild reinfection and considerable swelling of the soft tissue is to be expected in these cases, but no pains should be spared in placing the wound and keeping it in as aseptic a condition as possible. It should be washed out thoroughly with a mild antiseptic solution, and packed with iodoform, or some other medicated gauze, which should be changed not less frequently than every other day. For the first week every day should be the rule. In a few days, should granulations have made their appearance, and if all the necrotic tissue has been removed, we have but to protect these repair cells until they have filled in the cavity. Bismuth paste can sometimes be used with good results. If much pain be present, eucophen paste can be used, but for all practical purposes it is questionable if we have anything superior to narrow tape iodoform gauze for these conditions. Before dismissing this subject, let it be said that its importance entitles it to more extended consideration, but the wide scope of the paper will not permit.

The vast majority of neuralgias about the head and face, as well as a large percentage of the purulent antral empyemas are of dental origin, and any form of treatment which does not recognize this fact, will generally be rewarded with negative or, at best, indifferent results. The treatment of these conditions cannot be considered to-night, as the paper already is too lengthy a one, and considerable time is demanded for slides which illustrate the various dental lesions and points presented in the paper.

NOTE:—In interpreting a radiograph, the inexperienced will be helped if they remember that it is not in reality a photograph but rather a record of density. In the dental apparatus we have varying degrees of density, hence the sensitive film will record different impressions as the rays are intercepted by these structures. Dark areas in these illustrations will represent dense structures such as gold crowns, dowels, fillings, and also root canal materials. Natural teeth and porcelain crowns will be represented by areas less dark, while the alveolar process will be still less dark, on account of it being less dense. Canals of vital teeth as well as portions of unfilled canals can also be seen on a good radiograph. Where we have an abscess or a liquification of the process, we will have varying degrees of lightness depending on the extent of the necrosis. As gum tissues are not shown, many teeth are given an elongated and often exaggerated weakened appearance

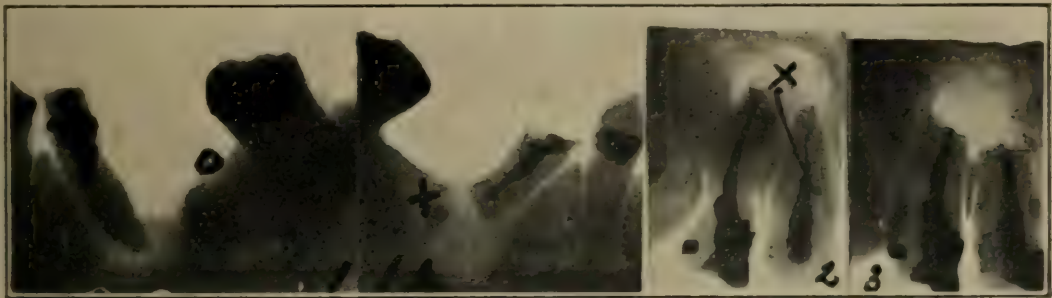


Fig. 1 shows a second bicuspid crowned root with canal filled less than half its length, resulting in a large area of necrosis. At the point x we have a fistulous opening, and from here the case was treated for nearly a year as the dentist suspected a retained molar root-tip. This treatment by burs and elevators accounts also for the almost total absence of process on distal side and would lead us to suppose it to be a hopeless wreck.

Fig. 1A. shows amputation of tip of root after which repair did not follow, as we had hoped it would. It also shows that the amputated root tip fell into the carious pocket, and acting as an irritant, prevented healthy granulations forming.

Fig. 2 shows a large area of necrosis over central and lateral. X shows a flexible probe which was passed labio-palitally, on which surface fistulae appeared.

Fig. 3 shows the same teeth amputated.

Fig. 4 shows first lower molar roots with apical abscesses. Note that mesial root (a) contains a broken broache. Second bicuspid shows resorption on account of imperfect root-canal filling.

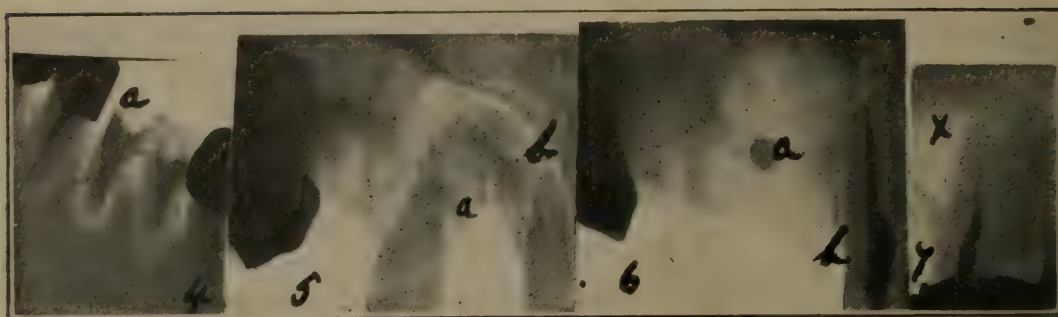


Fig. 5 shows a large necrotic area extending from molar to central, and involving apical area of central. (a) is an enamel bud, and adjoining it a vital cuspid tooth.

Fig. 6 shows same area as No. 5, with amputated central (b), and (a) shows enamel bud whose removal was necessary before repair took place, necessitating a second radiograph.

Fig. 7 shows cuspid tooth with large apical abscess (x) which resulted from imperfect root-canal filling.

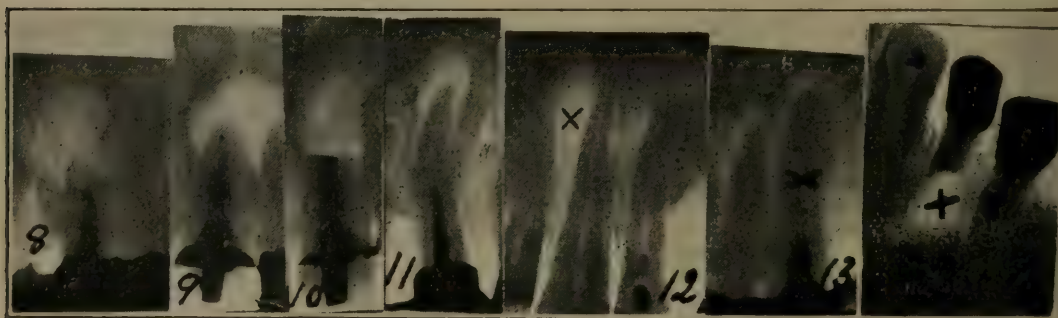


Fig. 8 shows the same after amputation.

Fig. 9 is that of a central with a large area of necrosis which resulted from faulty canal work.

Fig. 10 is a skiagraph of same after amputation of upper third of root.

Fig. 11 shows a large apical necrosis over cuspid whose root canal is filled not more than half its length. A pyorrheal condition is also shown.

Fig. 12 is a radiograph showing a liquification extending from bicuspid to lateral. Pulpes were vital, and note that we have no rarified area over species of teeth. This radiograph is typical of a very confusing class of cases and I have no doubt that the necrosis had its origin in a pericemental abscess.

Fig. 13 aided in the diagnosis of an obscure case of neuralgia. Note unfilled upper half (x) of cuspid with rarefied area about apex. With proper root-canal treatment neuralgia disappeared.

Fig. 14 shows amputation of fully one-half first bicuspid root and cuerettred area (x). Such a tooth if not nearly so much of a wreck as the radiograph would make it appear. However too much should not be expected of roots which demand such deep amputation.



Fig. 15 shows a perforated cuspid root (x) which has been repaired with amalgam. This tooth has been very comfortable for about four years.

Fig. 16 shows an impacted lower lateral tooth that gave no end of trouble until this condition was revealed by the radiograph.

Fig. 17 shows a crowned upper bicuspid root, the upper third of which is not filled. Note the near perforation of bicuspid also unclaimed molar canals which explains the lameness and often severe soreness of these teeth. The light area (x) shows outline of antrum and explains the ease with which infections of dental origin can invade the antrum of Highmore.

Fig. 18 shows cuerettred area (x), also amputation of tooth well into healthy tissue.

Fig. 19 shows retained bicuspid root tips that kept up a chronic alveolitis until radiograph revealed its presence after which treatment was comparatively simple.

EQUINE DENTISTRY.

BY J. N. PRINGLE, M.R.C.V.S.

In the first place let us notice what is probably the most common of all ailments in connection with the horse's teeth, viz, *sharp points*. These are really not a pathological condition, as they are found normally on most horses' teeth. More particularly the lighter breeds, and between the ages of five and eight years. They create trouble only from the fact of the animal's artificial surroundings, and are found on the outer border of upper molars, and inner border of lower molars. The points on the upper molars wound the cheek, "occasionally severely," at the first and second teeth by the bridle, bit and bit-rings, forcibly pressing the cheek against them. About the fifth tooth the strong muscle of mastication, "masseter" presses the buccal mucous membrane against them. These wounds become sore and inflamed, interfere with mastication causing the horse to lose spirit or vim, even may cause indigestion and loss of condition. The coat becomes dry and harsh and appetite is variable.

The driver, if careful, will notice these signs, as well as the more patent ones, viz., the horse may pull hard when being driven, or may pull to one side only. He will resent taking the bit and may slobber.

The treatment for this condition is simply to blunt these points with a float, the edges of the teeth must not be rounded off, except in the case of the first molar, which ought to be rounded or smoothed well over, as it is then less liable to wound the cheek when pressed against it by the bridle, etc.

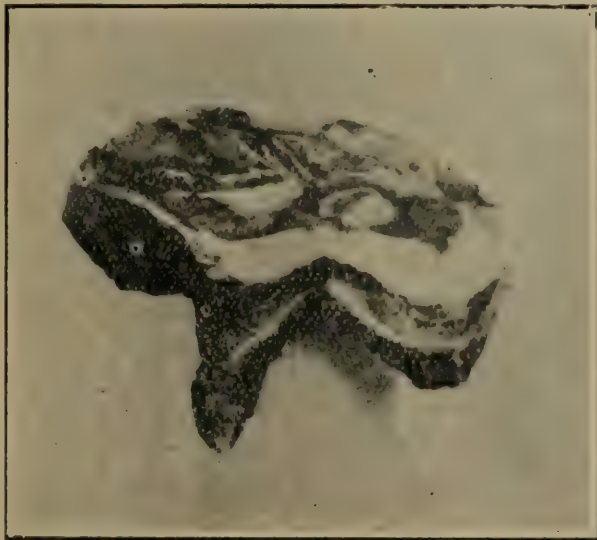


A Float or Rasp.

A horse suffering from these points, should they cause him to pull hard, is frequently supplied with a straight harsh bit which makes him pull harder than before, with the result that he will wound the jaw between the molars and incisors. This is termed *bit-gnathitis*." These wounds are sometimes severe, the bone of the jaw being sometimes worn half through, and occasionally fractured. This necessitates the horse being laid off work and treated, which consists of feeding the horse with soft food, and rinsing out the mouth several times daily with a mild antiseptic and astringent

lotion. Should the bone be much injured, it is necessary to wait until the dead piece of bone separates, when it can be easily removed, after which the wound quickly heals. Another method is to paint the bone with a weak solution of a mineral acid, to dissolve the dead portion instead of waiting until it separates. Another very common ailment in young horses about two and a half years old, is the retention of the caps or shells of the temporary teeth. This, of course, is only found in connection with the first, second and third molars. In the case of the first and second, which ought to shed at two and a half years, it is not usually noticed until the animal has lost considerably in condition or become poor, coat dry and harsh, with other symptoms of indigestion. This happens on account of the horse not being usually handled much at that age. In some districts, however, it does not happen so, as the colts are handled commonly at that age.

On examining the mouth, it will be found that one or more, "I have seen six," of these caps are loose, but refuse to fall off, as they normally ought to do. On removal, it is noticed, that



Cap of Deciduous Tooth.

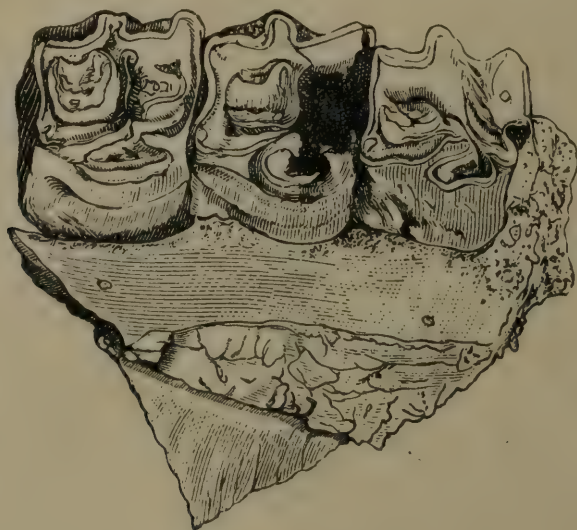
they have been held in position by a part of the fang of the temporary tooth, which has not been absorbed, and is still firmly imbedded in the gum, or even may have a slight hold in the alveolar cavity of the jaw bone.

The same condition happens in connection with the third tooth, six months to one year later, but in addition this tooth is sometimes found wedged between the second and fourth, which condition is occasionally rather difficult to diagnose. This wedging obstructs the growth of the permanent tooth, sometimes causing a bony enlargement, ostomae to form on root of it, creating an eyesore on the side of the horse's face.

The treatment is careful removal of the caps or shells of

the temporary teeth. As a rule a horse requires a little treatment, some cooling lotion to rinse the mouth, a little laxative medicine, a tonic, and soft food for some days. The bony enlargement on the face does not often require surgical interference. It being sufficient after removing the temporary cap, to rub in some absorbent ointment occasionally, when it will disappear in the course of a few months.

Caries is a very rare disease in the horse, but it is known. It is so rare that a specimen could not be found in the museum of the veterinary college in Toronto, nor have many of the professors ever seen a case. It begins at the crown, the dentine of the tooth becomes slightly darkened, softer than normal and gets worn out, leaving a hole in the tooth. The process of decay may penetrate to the pulp cavity, setting up pulpitis, etc., or the tooth may split from having become soft. This is also followed by pulpitis, alveolar periostitis, even otitis and necrosis of the jaw bone may follow, or abscess may form and open on the external surface of the skull.



Dental Caries.

The symptoms of this in the advanced stages is complete inability to masticate food. The horse will roll the bit in his mouth for some time then drop it out, covered with thick saliva. He may hold his head to one side, especially when drinking, he loses flesh rapidly, and altogether becomes unthrifty in appearance, soon showing inability to work. Horses from seven to nine years old are more commonly affected than at other ages with caries.

The treatment is removal immediately on discovery at whatever stage the disease may be in. However, it is possible enough to drill out the tooth, removing all cariesed dentine when, if the pulp cavity is covered sufficiently for its perfect protection by the dentine, the cavity may be partially filled with a very hard stopping, "silver amalgam?" This filling, however, can only last for a limited time. No substance has yet been discovered for the

purpose of filling horses' teeth, hard enough to be servicable to him for chewing hay or grain, etc.

Another disease, much more common than the last, is *necrosis*. This is probably the most common pathological condition found affecting the teeth of the horse. It affects the entire tooth. It is caused by interference to, or complete stoppage of, the blood supply of a tooth. In the young horse, "under six years," when this occurs the tooth becomes dessicated. It is soft and easily split. Sometimes an abscess forms at the root, on other occasions nothing happens, and the tooth remains in the jaw without giving trouble, and is only discovered when the teeth are being examined for other conditions, *sharp points, etc.* It will then be found much more worn than the others, or may be the crown will be fractured. It may, however, split to the pulp cavity, setting up pulpitis, etc. The symptoms of this as well as abscess is the same as split tooth from caries.



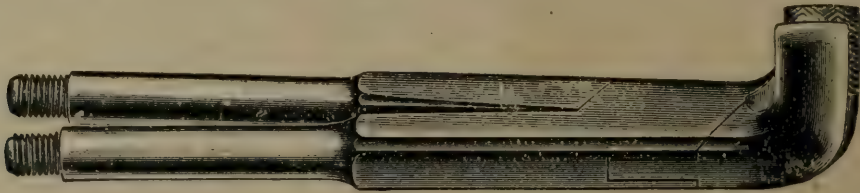
Necrosis of Jaw.

The treatment, but only if the tooth is giving the horse trouble, is again removal. When no inconvenience is occasioned to the horse, it is sufficient to remove the crown of opposing tooth. The operation is performed when possible with the horse backed into a narrow stall, and secured by the aid of a dental halter. Should the horse prove ugly, or the tooth be broken or worn so much that it can not be grasped with the ordinary extracting forceps, then the horse has to be cast, and the tooth *repulsed*. This operation is suitable for the whole of the under molars, except the fifth and sixth, and even with them it can be performed when there is a swelling over the root, and the fourth, fifth and sixth upper molars, the sixth only, however, in old horses. The first, second and third upper molars have to be extracted by the removal of the external alveolar plate, which is rather a complicated operation.

Direction for extracting a molar tooth with forceps. After securing horse as above, the teeth are first floated if necessary.

The tooth is loosened with a separator, then it is seized with the forceps, a fulcrum is inserted between the handle of the forceps and the teeth in front of the diseased one, and then the tooth is raised out of the socket and removed from the mouth. The cavity is then washed out with an antiseptic, and plugged with cotton wool. This ought to be done daily for about one week.

The majority of the horse owners in this country are frequently too careless in regard to the condition of the teeth of their servants, the horses, and many are equally careless as to the skill



Extracting Forceps.

and character of the man who drives about the country with a kit of beautiful nickel-plated dental instruments, and who is an utter stranger, but saying that he is proficient in the art of horse dentistry, that he will put all his horses' mouths into good shape for a certain sum. The pseudo dentist probably has a good appearance, is a good talker, and shows a business-like manner "for the money." He gets the work to do, and starts in, and every horse that he examines requires the teeth fixed, in some way, while some will certainly not need touching, and those latter cases are simply made bad, not cured. He files the teeth, taking off a part of the cutting surface, that which the horse was using to advantage to keep himself alive, and well, therefore, all that this pseudo dentist accomplished was to waste a portion of the teeth and probably upset the horses' digestion for a time, because of the alteration in the table surface of the teeth and also to shorten the life of the horse, as a horse is done so far as his usefulness is concerned just as soon as his teeth are worn out. The same thing holds good even in cases that do need floating, if too much is taken off, and herein lies the principal point. This pseudo dentist will float, and float, until he files off a considerable part of the teeth and when finished will say, that is well done, that horse won't need fixing again for a long time, which is sometimes true, the horse being more in need of a new set of teeth from this operation than anything else in the world. These operators then do incalculable harm, which is unfortunately not often noticed for some time after the treatment, and the departure of the dentist. This wandering gipsy then has nothing to recommend him. The only claim he has to his vocation is about \$70 worth of instruments which any one can buy. He has neither knowledge from education nor experience. The only thing other than the instruments he possesses, is *gall*. But, so long as the public,

"farmers especially," will patronize such quacks, so long will they lay themselves open to be swindled and suffer loss. Their would-be benefactor has got their money, gone on to the next place, and is out of their district before any of the evil results of his handiwork have manifested themselves, and what does he care?

The writer had a special experience of this some years ago, in a district that one of the *famous* gentlemen of the road had visited. He held demonstrations and gave lectures, etc., and charged each one who attended his class a certain fee. I have no doubt he made his lecturers and demonstrations interesting and entertaining, but as I know he left some very interesting cases behind, which he had bungled, and which required much treatment later, incurring great loss of time as well as expense to the owners, and much unnecessary inconvenience and pain to the horses.

Though the heavier breed of horses suffer less from sharp points and retention of caps than the lighter breed, it is none the less necessary and would be profitable to the owners of horses to have all their horses' teeth looked to every year or at furthest every year and a half, but they should see to it that the man who does the work will only do what is necessary, not overdo anything, and only repair where repairs are required. If I might make a suggestion, the veterinarian in the district, "if he does such work," is the best person to employ, because he is always at hand to answer for his sins, and he is able always to deal with the more serious conditions and to give advice as to treatment of complications.

I am sure also that he will not spoil the horse's mouth by doing what is not required.

I did not intend in this article on equine dentistry, to in any way make pretense of educating the practitioner, but merely to give a little straight and honest advice to the ordinary owner of horses, and by so doing, enable him to better judge as to the necessity for attention to his horses' teeth, to know better when such attention is required, and also to know when he gets the work well done.

THE PAST AND FUTURE OF PREVENTIVE MEDICINE.

By JAMES ROBERTS, M.D., Hamilton, Ont.

Read before the Hamilton Dental Society.

Any survey of the recent progress in public health and sanitation must be singularly incomplete, unless more than passing recognition be given to the work in which you, as a profession, are specially interested. In the direction of helping the science of preventive medicine to a higher plane of usefulness that work, especially during the last few years, has contributed a magnificent donation.

Half a century ago there was no such thing in existence as a science of dentistry. The travelling medicine man with his coal oil torch, his stove pipe hat, his powerful tones, his windy but persuasive eloquence, the eager throng of "well to-day," but "expecting to be sick to-morrow," jostling one another in a frenzied effort to exchange their silver for his tonics or his ointments, is still to be seen in the market place, but the tooth extractor of your childhood days, as he went from town to town gorgeously attired, with long flowing hair and brass band in attendance, will be nothing more to the memory of future generations than a species of extinct curiosity.

The art of preserving teeth, according to a practical and scientific method, had its origin on this continent and is a tribute to American genius. While the American graduate in medicine travels to London or Paris or Berlin or Vienna to complete his medical education, the European dentist, in order to get in touch with the latest and best in his art, comes to this side of the Atlantic.

You will all at once agree with me that the time-worn dictum, "An ounce of prevention is worth a pound of cure," is as applicable to dentistry as to medicine, and that the best and most wonderful triumph of dental science is dental hygiene.

Now, with the popularizing of medical education in the future, so that the poorest and most unintelligent realize to some extent the importance of proper mastication on the digestion and assimilation of food, and with the spread of knowledge concerning the care and preservation of the teeth among the children of our public schools, and demand for your services, and the sphere of your usefulness, will be correspondingly increased. In what direction and to what extent it will be necessary for you to reinforce your general knowledge, and to perfect your technical initiative and dexterity, in order to keep pace with the growing requirements of your speciality, it will scarcely be necessary for me here to touch upon. These problems you have always with you—at your offices, in your evenings of leisure, in your journals, at your association meetings, etc. In the course of my remarks, the relationship of dental hygiene to the prevention of disease, must be discussed in one or two of its phases, but I take it for granted that you wish me to say something to you to-night about public hygiene, in its broader and more comprehensive aspect of a great evolutionary movement, or rather parallel series of movements along similar lines, assisting one another, but with a common object in view—the development of a physically and mentally stronger and better race, and a realization for the individual of a happier and more rational existence.

The present age, when we compare the status of hygiene in all civilized countries, with that which it has attained in any previous period of the world's history, may not inappropriately be called "The golden age of sanitation." The recent history of that science, whether in the United States or Central America, in England or Southern Europe, in India, Japan or the Philippines, shows triumphs which might well fill us with wonder, did there not arise within us a far greater wonder that they were so long delayed. The earliest attempts to apply reason to medicine—the teaching of Hip-

pocrates—given to the ancient Greeks, 500 years before Christ, in the days of Socrates and Plato, the time of her intellectual vigor and supremacy had in a few centuries fallen into desuetude or been forgotten. Previous to this time, mankind in the very early, as well as in the prehistoric civilizations, and also among rude tribes in all of the world to-day, ascribes his diseases either to the wrath of a good being, or to the malice of an evil one. With the dawn of Christianity there was developed concerning the cause and cure of disease a reconciliation between, first, the notions of aboriginal peoples, and second, the ideas obtained by a literal interpretation of the Hebrew sacred books. Out of this reconciliation grew, in the course of a few centuries, an intensified form of the belief that physical disease is an evidence of divine wrath or satanic malice, with, at the same time, a never-ending multiplication of absurd, cruel and unnatural theories, based upon the effort to pacify these occult powers, which, were they not to some extent recorded history, would to the 20th century mind appear inconceivable.

Pestilences and plagues, in the middle ages, as in the days of Aaron and David, were ascribed to the wrath of the Gods, and so we have the epidemic where fourteen thousand and seven hundred of the children of Israel were carried off, and which was only stayed by the offerings of Aaron; the pestilence which carried off seventy thousand, in the reign of King David, only averted by burnt offerings; the black death and sweating sickness, from the former of which there perished in England, in the middle of the fourteenth century, more than half of the population; the plague of Paris, in 1552, which killed sixty-seven thousand people, and in 1580, twenty thousand; the great plague in England, in the seventeenth century, and that which raged in Southern Europe in the eighteenth, as well as numerous invasions of cholera in the nineteenth, have left behind them disastrous results; the bubonic plague in the time of Justinian, so graphically and intelligently described by Gibbon in his "Decline and Fall of the Roman Empire," has probably never been surpassed in appalling virulence. Gibbon, more than one hundred years ago, says: "Contagion is the inseparable symptom of the plague, which by mutual respiration, is transferred from the infected persons to the lungs and stomachs of those who approach them. While philosophers believe and tremble, it is singular that the existence of a real danger should have been denied by a people most prone to vain and imaginary terrors. Yet the fellow-citizens of Procopius were satisfied by some short and partial experience, that the infection could not be gained by the closest conversation, and this persuasion might support the assiduity of friends or physicians in the care of the sick, whom inhuman prudence would have condemned to solitude and despair. But the fatal security, like the predestination of the Turks, must have aided the progress of the contagion: and those salutary precautions to which Europe is indebted for her safety, were unknown to the Government of Justinian. No restraints were imposed on the free and frequent intercourse of the Roman provinces; from Persia to France, the nations were mingled and infected by wars and emigrations and the pestilential odor, which lurks for years in the bale of cotton, was

imported by the abuse of trade into the most distant regions: the places which had escaped the fury of its first passage, were alone exposed to the contagion of the ensuing year. No facts have been preserved to sustain an account or even a conjecture of the numbers that perished in this extraordinary mortality. I only find that during three months, five, and at length ten thousand persons died each day in Constantinople: that many cities of the East were left vacant, and that in several districts of Italy, the harvest and the vintage withered on the ground. The triple scourge of war, pestilence and famine afflicted the subjects of Justinian: and his reign is disgraced by a visible decrease of the human species, which has never been repaired in some of the fairest countries of the globe."

The comets following stars and earthquakes, which incidentally preceded or occurred contemporaneously with these disasters, were considered on scriptural authority, to be "signs and wonders," evidences of Divine anger, heralds of fearful visitations, and this belief acting powerfully on the minds of millions, did much to create a panic terror, sure to increase epidemic disease and accentuate its effects. The cause of this immense sacrifice of life is now known to have been the lack of hygienic precautions in the Eastern countries where they originated, and in the European towns through which they spread. In the East, living in filth on the part of men high in the church, was considered evidence of sanctity and holiness. Certain books that have come down to us from these times, dwell with complacency, and show encomiums on distinguished men of the times, who lived in surroundings and stench intolerable. Jews and witches were supposed to be the special emissaries of Satan in causing pestilence—Jews, because they escaped with a less percentage of disease than Christians in the great plague periods, due in a great part to the sanitary system which they probably had evolved thousands of years before in Egypt, and which had been handed down orally and in writing by their statesmen. In Northern Germany, the stronghold of Protestantism in Luther's time, myriads of innocent men, women and children were tortured, mutilated and put to death, to carry out the injunction of the Biblical text, "Thou shalt not suffer a witch to live." With nothing but appeals to fetich and incantation, no wonder the death statistics were appalling. There were districts in which not more than one in ten escaped, and some were entirely depopulated. At the time of the plague and great fire in London, the prisons of the period were vile beyond conception. Jail fever raged there and elsewhere, spreading from dungeon and corridors without disinfection, ventilation or drainage to habitations outside, and from there the infection travelled from town to town. Lord Bacon declared jail fever "the most pernicious infection next to the plague." The same sort of thing was seen among the Protestant colonies planted in New England in the 17th century. The pestilence among the Indians was attributed to the Divine purpose of clearing the country for the heralds of the Gospel. Among the white population, it was attributed by the same authority to devils and witches. Cotton Mather, in his "Wonders of the Invisible Universe," tells us: "Plagues are some of these woes with which the devil troubles us.

'Tis the Destroyer or the Divil that scatters plagues about the world; Pestilential and Contagious diseases. 'Tis the Divil who do's oftentimes invades us with them. 'Tis no uneasy thing for the Divil to impregnate the Air about us with such malignant slats as meeting with the salt of our microcosm, shall immediately cast us into that Fermentation and Putrefaction which will utterly dissolve all the Vital Tyes within us, Ev'n as Aqua Fortis made with a conjunction of Nitrae and Vitrol corrodes what it seizes upon. And when the Divil has raised Arsenical fumes which become venemous. Quivers full of terrible Arrows, how easily can he shoot the deleterious Miasmas into those juices or bowels of men's bodies which will soon Enflame them with a mortal Fire. Hence come such plagues, as that Beesome of destruction, which, within our memory swept away such a throng of people from one English City in one visitation: and hence those Infections Feavers which are but so many distinguished plagues among us, causing Epidemical Desolations."

Against this background of bigotry and ignorance, pestilence and death, stands out in splendid relief, the life-story and the struggle of the men who, in these centuries of error and superstition, carried aloft the torch of truth.

Vesalius, the anatomist, getting his bodies for dissection in the face of the obstacles invented by theological prejudice, fearful of losing its hold on the ignorant masses; driven from place to place: compelled, in order to protect his life, to dedicate his books to the most rabid bigot of the time, the Emperor Charles the Fifth, was, at last, on the accession of Philip the Second, forced to become a wanderer, shipwrecked and lost to the world, "and yet, not lost." "By the genius of a great painter Vesalious again stands on earth and we look once more into his cell. Its windows and doors bolted and barred within, betoken the storm of bigotry which rages without: the crucifix towards which he turns his eyes symbolizes the spirit in which he labors; the corpse of the plague-stricken beneath his hand ceases to be repulsive; his very soul seems to send forth rays from the canvas, which strengthen us for the good fight in this age."

Servetus, less fortunate than Vesalius, unable to propitiate his tormentors even by a humiliating recantation of work which he knew to be true, was burned at the stake by John Calvin. Thomasius we see sacrificing his reputation and his friends. Flade, tortured and racked into confessing anything suggested by his blood-thirsty persecutors, was strangled and burnt. These are but representative types of the men who, in the darkest ages of the world's history, sacrificed themselves for the benefit of mankind.

"Thoughts for which great hearts once broke we

Breathe cheaply in the common air."

In a brief outline I have endeavored to sketch some of the tragedies incidental to nineteen centuries of progress. Were it not that the lives of such men as Roger Bacon, Abelard and Thomas

Aquinas were drawn away from devotion to science to the barren ways of theology, typhoid fever, diphtheria, consumption, pneumonia and cancer which now carry off so many lives would perhaps have long ceased to scourge the world.

In spite of the difficulty and slowness of the process, however, not only has progress been made, but in the light of our present day knowledge concerning the mode of transmission in certain diseases it is difficult to conceive that the scourges which in the past have decimated the race can ever again overpower us with their one-time virulence. Of these small-pox, cholera, typhus and yellow fever are familiar examples. There is no more heroic chapter in the book of preventive medicine than the conquest of yellow fever. During six and one-half weeks of the year 1793, this disease killed in Philadelphia one-tenth of the entire population. In 1853 it killed in New Orleans alone 8,000 people, while in 1878 the mortality in Louisiana, Alabama and Mississippi was nearly 16,000.

Physicians have maintained numerous and widely divergent theories about the cause of yellow fever ever since they began to treat it. In 1890 Surgeon General Sternberg appointed an Army Board consisting of Walter Reed, James Carroll, Jesse Lazear and Aristides Agramonte to investigate the acute infectious diseases prevailing in the Island of Cuba. The result of their work was a demonstration that yellow fever is carried by a variety of mosquito, a demonstration so perfect in the end as to silence practically all expert opposition. Lazear died in the course of the experiments as a result of allowing himself to be inoculated.

Following upon this remarkable discovery, anti yellow fever measures were undertaken in Cuba under the direction of Wood and Gorgas. By the ordinary measures of cleanliness, improved drainage and general sanitary measures the death rate in Havana had been reduced by four-fifths in three years, but with no effect on yellow fever, as a severe epidemic occurred in 1900. Anti mosquito measures were at once taken. The city was divided into some thirty districts, each comprising about one thousand houses with an inspector and two laborers for each. All collections of water were ordered to be covered under penalty, the rain barrels of poor families being covered at the expense of the Board of Health. Cesspools and stagnant collections, wheresoever, were covered with petroleum and fresh water collections, where the law was not complied with, were emptied from the receptacles and the latter destroyed. Yellow fever was wiped out virtually in Havana with a death rate of less than five in 1898.

Similar results followed similar precautions in New Orleans in 1905.

From July 1st to August 12th there had been 142 deaths in 912 cases. The Public Health and Marine Hospital Service took hold, employing almost entirely measures directed against the mosquito, the number of cases began rapidly to diminish and the out-

break ended with 460 deaths as compared with 4,000 in 1878, notwithstanding the striking increase in population over that period.

Colonel Gorgas, in 1904, with the assistance of Mr. LePrince, chief of the Mosquito Brigade in Havana, began active work in the Panama Canal zone and already that region has been changed from one fatal to life by the presence of disease to a district as safe for residential purposes as almost any country in the world.

When the waters of the Atlantic and Pacific commingle and the voyage from New York to Manila is shortened by 6,000 miles, the Panama Canal will have been built by sanitary science and this marvellous engineering achievement will be its most enduring monument.

But I should be guilty of unjustifiable optimism did I not remember that, notwithstanding the success of the past—"By far the most dangerous foe we have to fight, even to-day, is apathy—indifference from whatever cause—not from lack of knowledge, but from carelessness, from absorption in other pursuits, from a contempt bred of self satisfaction." At the opening of the 20th century we are still confronted with problems sufficiently large to tax the energies of the most competent sanitarians that knowledge and expert training can produce. Tuberculosis still kills its thousands annually. It is true that in England and certain parts of this continent a reduction of 50 per cent. in the mortality has been effected within the last fifty years. But the millions of dollars invested in sanatoriums in different countries have not brought about the expected results. The cause is not far to seek. I have always believed that ultimately this disease will prove to be vulnerable only when attacked in its breeding grounds—the home, the school, the workshop, the factory, the store. The problem of this disease in every country is a problem associated with, in fact, intimately bound up with, the social and economic problems of that country. Sooner or later society will have to face the stern, cold fact that it cannot escape the consequences of conditions which are allowed to aggravate themselves, particularly in the growing cities—conditions which politicians and statesmen profess to be unable to grapple with. I mean the problem of the underfed, overworked, poorly housed, laboring classes.

"While speaking of tuberculosis we are reminded that one of the earliest and most frequent symptoms of the disease is an impaired digestion. Bad teeth do not constitute the only cause of digestion disturbance, but they are, without the slightest doubt, in more instances than has generally been recognized, contributory to a pathological condition of the stomach, besides being avenues of entrance for tubercle bacilli, accidentally inhaled or gaining entrance by secondary infection. Preventive medicine, realizing the soundness of a common, if not classical, observation "that one cannot teach an old dog new tricks," has very wisely determined to direct its attentions toward children, and especially, as being

more readily accessible for the desired instruction, to the children in the public schools.

"In the United States, upon a conservative calculation, it has been estimated by competent authority that 12,000,000 children have physical defects, over 1,200,000 handicapped by malnutrition, by enlarged glands over 5,000,000, by bad teeth over 8,000,000, by defective breathing over 7,000,000. Recent investigation shows 95 per cent. of public school children suffering from decaying teeth.

"In face of the fact above mentioned, that the virus of tuberculosis manifests its presence in the system primarily by impairment of digestion, one scarcely needs to emphasise the need of good, sound teeth in its prevention, and with this end in view the New York Health Department issues the following leaflet and distributes copies freely to all parents through the children:

" 1. The physical examination of all school children shows that in many instances the teeth are in a decayed and unhealthy condition.

" 2. Decayed teeth cause an unclean mouth. Toothache and disease of the gums may result.

" 3. Neglect of the first teeth is a frequent cause of decay of the second teeth.

" 4. If a child has decayed teeth it cannot properly chew its food. Improperly chewed food and an unclean mouth cause bad digestion and consequently poor general health.

" 5. If a child is not in good health it cannot keep up its studies in school. It is more likely to contract any contagious disease and it has not the proper chance to grow into a robust, healthy adult.

" 6. If a child's teeth are decayed it should be taken to a dentist at once.

" 7. The teeth should be brushed after each meal, using a tooth brush and tooth powder. The child should take the tooth brush and tooth powder to the school and receive instructions from the nurse as to their proper use."

"The Division of Child Hygiene of the Department of Health through its medical inspectors and nurses gives each child in the public schools a complete physical examination, including the teeth. During 1909 231,081 children were examined, of whom 131,747 were found to have defective teeth, and of these latter treatment was provided through the dispensaries and private dentists of the city for 4,616 children. However, for the large number of children unable to get proper treatment thorough instructions are given by the nurse in the hygiene of the mouth and the use of the tooth brush. These instructions are given again and again in the homes, whenever the nurses have occasion to make visits, and as many as possible in the family are included in the audience.

"The above is a brief outline of dental hygiene in its relation to tuberculosis as found workable in public schools.

“Given a case of incipient tuberculosis the modern treatment is summed up in fresh air, plenty of wholesome food and water, the proper relation of rest and work and from time to time, as required, medical advice from an expert. Of these requirements by no means the least essential is the daily supervision of the patient’s food supply. It is the easiest advice in the world for a physician to say to his patient, “get your teeth attended to,” or, “get plenty of good, nourishing food and chew it well before taking it into the stomach,” but we all of us pretty well comprehend why, in so many instances, the good advice is so entirely disregarded. There are in all of the large cities of this continent thousands of consumptive poor, in a large proportion of whom dental attention is required.

“How entirely superfluous then to say to these poor unfortunates and sufferers, ‘chew your food well and eat sufficient,’ when in order to get well and cease to become a menace to the rest of the population they are handicapped and at a standstill in the most essential element of the treatment. Need I say to you, so thoroughly alive to the significance of the facts, that right here and to-day in this city of growing industrial activity and growing industrial population there is urgent need for the plain, unadulterated truth to be hammered home somewhere. Perhaps with greater hope for immediate success we could gain entrance into the hearts and sympathies of some of our wealthy men or wealthy women who, with a taste for practical philanthropy, would like to see the good seed of their generous impulses fall on a fertile soil, spring up and yield results, not of the thirty or sixty, but of the hundredfold dimension.

“To equip every sanatorium or special hospital for consumptives with a dental office or offices and also every large public school with, in addition, all the material needed for the efficacious treatment of every child of the deserving poor, here indeed is abundant opportunity to confer untold benefit on the men and women of the next generation and to assist in the attainment of that goal for which so many truly great are giving up their lives,—the eradication of the great white plague.”

Equal in importance to the tuberculosis question is the campaign which is bound to come for the elimination of venereal disease. In preventing and checking contagious disease by public control by reason of prudery and false modesty these diseases are never mentioned. In the near future society as a whole will be as keenly alive to the necessity of fighting syphilis as now it is aroused concerning tuberculosis.

“Incomplete statistics gathered by a committee from the American Society of Sanitary and Moral Prophylaxis show that gonorrhea and syphilis constitute a total morbidity nearly double that of all other contagious and infectious diseases, both acute and chronic combined, and while every other contagious disease is controlled on account of its danger to the public health, this, the most virulent of all, is left to enact its toll of dishonor, disease and

death. Out of 895 cases of syphilis it was found 489 occurred in men, 303 in women, and 103 in children, 93 per cent. of the latter being hereditary infection, every syphilitic child representing four dead from abortion or immaturity. The report of this committee showed in comparison with 58 cases of smallpox, reported by the Board of Health, 20,706 cases of this great pox. Hundreds of thousands of dollars are spent every year by United States Government to stamp out smallpox, while this, a hundred times more formidable as a social danger, is abandoned to its own evolution, unchecked and unnoticed. Exactly similar conditions exist in every country in the world and in some, I regret to say, the conditions are even worse."

"The responsibility of the male factor in the spread of these diseases has always been minimized. This constitutes the radical fault in regulation from a sanitary standpoint. No more insufficient sanitary measure could be devised than the examination of public women with a view to eliminating sources of contagion, while the male factor in the spread of the disease is entirely ignored. The sanitary feature of this system is condemned by its practical results without reference to objections on moral grounds."

Moreover dreadful as are these diseases in themselves and their immediate results, it is the disease which produce the conditions which are a thousand times worse, accordingly, whatever work may be done in protecting women and enabling them to earn a livelihood, or in instructing children or in prosecuting men and women, it is evident that we may look for complete reform only by a change in public opinion, we may look for an amelioration of this evil only by placing greater emphasis on other activities of life."

An increasing demand is being made by social reformers for a stricter state control of marriages. An examination of the conditions which prompt this demand will show the justice of the representations and make clear the need of state prevention of unsuitable marriages. People suffering from the widely spread disease already considered, tuberculosis and syphilis, and all those subject to mental diseases not confined in asylums, are free to contract marriages by which these diseases are transmitted to the succeeding generations and the contagion more widely spread than before.

Here is a problem of exceeding difficulty in the control and prevention of disease, a problem which must be met else all the other work of preventive medicine will fail and the work become nothing.

Hospitals and asylums are ineffective to stop the flood of degeneracy and disease perpetuated in this manner. Charity unwisely bestowed defeats the purpose for which it is given: enormous sums are wasted in the care of unfit and useless members of society. "If we were as careful in the rearing of men as in the breeding of domestic animals, many of the evils which now afflict humanity would disappear." An appalling instance for the necessity of reform is shown in the following: Echaveria, after making research,

reported that 62 males and 74 females gave birth to 159 children, with these results: 28 were still born, 195 died with convulsions, 78 were epileptics, 18 were idiots, 39 were paralytics, 45 had hysteria, 6 had cholera, 11 were insane, 7 had strabismus, 27 died in infancy, and 105 were apparently healthy. This appalling account illustrates the depravity taking place throughout the country because of improper marriages."

Closely associated with this sociological condition and in some respects its outgrowth, is the prevalence of drug habits in various forms, the commonest being alcoholic intoxication. There is hardly a disease to which alcohol is not a contributory factor, nephritis, cirrhosis of the liver and hardening of the arteries.

Investigation by Prof. Henry Farmon of Yale University from an economic standpoint found alcohol to be responsible for 25 per cent. of all cases of poverty coming under the eyes of charity organizations, and 37 per cent. of all cases in alms houses. It was directly responsible for 31 per cent. of criminals and indirectly of 50 per cent. This problem has been attacked, largely along moral lines, yet it seems to be one that should be approached from the medical side and by educational methods as well.

I have already kept you long.

These are merely one or two of the great difficulties remaining for the future to solve. Much has been done, much remains to be done, but in looking over the achievements of the past the words of Darwin become significant, "It is those who know little, not those who know much, who so positively assert that this or that problem will never be solved."

TREATMENT OF CHILDREN.

MILDRED HANNA, D.D.S.

Read before the Ottawa Dental Society, January 9th, 1911.

Mr. President and Gentlemen,—I esteem it a very great honor to have been asked to address you on this important subject. Yet it is with feelings of reluctance, not to say timidity, that I present this short paper for your discussion, feeling that I shall not tell you anything original or that you do not know already. I can only hope to bring to your attention a few points, the discussion of which may be of mutual benefit to us all.

Someone has said, "A nation's best assets are her men and women, well-developed physically, mentally and morally." It might further be said that her future depends on the care and development of her children along these lines. It is a well-known law of nature that physical health and mental activity are closely related to—in fact are dependent on each other. Therefore, it devolves on us who are responsible in a measure for the physical

welfare of the youth of our land, to be up and doing, if we are to have our share in the building up of a nation of men and women second to none in the universe.

At the present time, we are told, Germany holds first place in looking after the physical welfare of her children in the schools; but with the present crusade against mouth-disease and neglect among our school children, as carried on so admirably under the direction of the different provincial educational committees, and the educational work being done along the lines of oral hygiene for the benefit of the public, at their instigation, Canada ought soon to hold second place to none in the work of reforming the existing somewhat appalling condition of things found among our school children of all classes.

The importance of the care of children's teeth from earliest infancy, until after the period of greatest susceptibility to caries, cannot be over-estimated. Keep the teeth in a state of repair, and the oral cavity in as hygienic a condition as possible during this period, and you have almost insured the child's future, as regards a sound masticatory apparatus.

In the treatment of children's teeth, we have two phases of the subject to deal with,—the management of the child and the management of the teeth. Having succeeded with the former, the latter is comparatively easy for us.

As most of us know from experience, one of the most difficult things we have to contend with in dealing with children, is their natural fear of everything pertaining to the dental office—and just let me add, that this natural child's fear is often increased a hundred fold by the tales of torture narrated to them at great length and often with vivid illustration, by those who are old enough to know better,—much to their discredit be it said.

A striking example of this came to my office not long since, in the case of a boy of fifteen,—a thoroughly manly little chap in every way, but his fear of having a tooth extracted was so great that it took him a good half-hour, and all my power of reasoning and persuasion, to allow me to remove a loose deciduous molar for him, and he told me after, when apologizing for his cowardice, that he didn't think he would be so afraid of being hurt if he hadn't been told such "awful stories" about how it hurt to have a tooth extracted.

As a rule children are ready to respond either to reasoning or coaxing, or both, depending on their age and temperament. Occasionally one must resort to bribery to a certain degree, but it is surely not advisable, except when all other means of gaining a mastery over the child have failed utterly. Above all else a child should never be deceived with regard to the operations to be done for it. Do this once, and you have practically forfeited the childish confidence and trust in your word for good. Better explain to the child something of what is to be done for it, and that it may hurt

a little at times, but that you will do everything you can to make it as easy and short as possible. It is surprising the amount of pure "grit" some of these little patients will show when they realize it is necessary.

The necessity for short sittings for children need scarcely be mentioned, it is so self-evident a requirement in their treatment. Half an hour at the longest is sufficient for the majority of cases, and less if signs of fatigue or nervous tension are much in evidence. If nothing more than an examination is made at the first sitting, along with the task of gaining the child's confidence and overcoming his fear, considerable has been accomplished.

As for the operator, unless he (or she) is prepared to delve deeply into his store of kindness and patience, and use these in unlimited supply, it were better that he leave entirely alone the management and treatment of children in the dental operating room.

There is one other difficulty which has often proved a source of trouble to the writer, and that is the desire of parents and friends of the child to remain beside the operating chair, where their well-meant but most inopportune interference often results disastrously for the operation in progress. Since the rule has been made to allow no one to remain in the operation room but the operator and the child, there has been less trouble that way, and only an occasional fond mother fails to see the reasonableness of being asked to take a seat in the waiting room.

In early childhood, of course, we have only the deciduous teeth to deal with, and there is no more important part of our work than the care and proper treatment of these. Being the fore-runners of the permanent teeth, their condition greatly influences the formation and eruption of these. Then, too, we have at last come to understand that the pain and suffering children undergo from diseased deciduous teeth, is just as severe as that in later life from the permanent; and that such discomfort is even more injurious to their growth and development at this time than later on in life. Many a so-called dull and troublesome child in school, would be found to have ample cause for its shortcomings, if the conditions in the mouth were noted.

The fact that, with a comparatively small cavity in the deciduous teeth, we may have an exposure of the pulp makes them more difficult to deal with than the permanent teeth in some regards.

The use of spoon excavators in removing the decay from such cavities, is naturally indicated, as there is much less likelihood of plunging into the pulp chamber, than with the hatchet form.

In the selection of filling materials for cavities in deciduous teeth, the first requirements are naturally ease of insertion and non-irritability. Among those provided for our use, cement and gutta-percha have been found to possess these qualifications, and

so must often be used even at the expense of durability of the operation. In the case of the incisors, permanency of operation is not usually a necessary requisite as these are early lost. But a different problem confronts us, when we find the deciduous molars badly decayed at say six or seven years of age, with three or four more years of usefulness to put in before they are lost. If we could only see these in the early stages of decay, what hours of trouble and pain it would save the little patient. But the fact remains that in more than fifty per cent. of the cases that come to us, the decay has reached the pulp chamber, and we find the pulp in various stages from inflammation to putrescence.

In the smaller shallow cavities the treatment is comparatively simple and consists in as thoroughly as possible removing the decayed and softened dentine and filling the cavity with amalgam or gutta-percha if posterior, cement if anterior.

In the more deep-seated cavities involving the pulp, it must first be ascertained whether there be any possibility of saving the vitality of the later. If only a slightly inflammatory condition exists, this may often be done with very satisfactory results. The writer has found most efficient the well-known method, as taught by Dr. A. E. Webster, of Toronto, of sealing a penetrating but agreeable and non-irritating antiseptic dressing in the cavity and allowing to remain for twenty-four to forty-eight hours; then having covered the floor of the pulp chamber, and the exposure, if there be one, with a paste of zinc, oxide and oil of cloves, fill the cavity with oxyphosphate. This will usually keep the teeth comfortable for a goodly length of time, until both the teeth and the child are in a more matured condition for having the pulp removed, the canals filled, and a more permanent filling inserted in the cavity of decay. Should the pulp show signs of putrescence, it may be desensitized with pure carbolic acid, and as much as possible of it removed without pain to the little patient. Then having made a paste of zinc oxide and formocresol, carefully pack this into the pulp chamber and upper portions of the canals, and cover with oxyphosphate as before.

Of course, these must be considered as purely temporary operations, but if they serve to tide the child over the period of suffering, and to conserve the tooth until the proper time for its removal to give place for the permanent tooth, they have indeed served a worthy purpose.

The eruption of the permanent teeth may be said to begin about the sixth year, and continue until about the twelfth year,—and during this time the closest surveillance is necessary to preserve them from decay. We know that during this period of life important physiological changes are going on, which cause an increased demand on the nutritive and assimilation processes of the body, thus lowering its resistance to micro-organism. The oral secretions

also seem to be especially favorable to the growth of germs during this time.

Thus we find this period of life one of marked susceptibility to caries, and in some cases, in spite of our best efforts to prevent it, tooth decay runs riot, so to speak, and many perplexing problems present themselves.

Since it is an established fact that the susceptibility of teeth to decay is not due to any inherent quality in tooth structure, but rather to their environment, then so long as these conditions favorable to the progress of caries continue, are we going to have continuance of tooth decay.

What, then, under these conditions, shall be our guiding principle in the preparation of cavities? Is it advisable or even possible to try to extend them into immune areas? Is it not better, considering the usually hypersensitive dentine and the condition of the mouth in general during this time, to merely extend the cavity for access for the time being?

This leads to the question of the kind of filling material to use in these young patients—say from nine to fifteen years of age. When one considers the number of cases that are present in which gold fillings have been inserted during this period of life, and at their margins, are in a most deplorable state, and instead of protecting and preserving the tooth, have been merely serving as a harbor for germ media,—one is inclined to consider the use of gold in these cases a “negative remedy” or “a good thing in the wrong place.”

Is it not much better to use freely, but judiciously, the much abused oxyphosphates in many of these cases, especially in the anterior teeth? As a protector of tooth tissue there is nothing better, and surely it were wiser to renew it time and again, keeping the tooth cavity the original size, until such times as conditions in the mouth are favorable to the proper preparation of the cavity, and the insertion of gold or other more permanent filling materials.

It is scarcely necessary to mention the importance of watching carefully the condition of the first permanent molar—“the keystone of the arch,” as it has been called. We as a profession have come to know so well the inestimable value of retaining it in its proper position, and the irreparable injury occasioned by its loss or malposition, that it remains for us to faithfully endeavor to educate the parent of children,—first to the fact that this is a permanent tooth, and then that it is of primary importance that it should be watched and preserved. When we have done this, we will have accomplished much.

After all, when we have so impressed on the parents first and then on their children, the importance and necessity of oral hygiene, that we shall have their efficient and constant co-operation in our efforts along the lines of preventive dentistry,—when we have accomplished this, we may not have so many fillings to insert

at so much apiece, but we shall have the knowledge that we have been instrumental in allaying the progress and preventing the growth of one of the greatest maladies of the human race,—caries of the teeth.

DISCUSSION OF DR. HANNA'S PAPER

BY DR. W. C. McCARTNEY, OTTAWA.

Mr. President,—I want to first of all congratulate the essayist on the masterly manner in which she has presented this very important subject, "The treatment of children." She has shown us that she has the subject well in hand, and that she understands the mode of procedure in reaching the little hearts of the children, who present themselves for treatment.

Dr. Hanna has emphasized the fact that the confidence of the child must first be obtained, before any work can be done. This is one thing I always endeavor to do, unless the little patient is suffering, when the alleviation of pain may be resorted to and at the same time start up conversation with the little patient. You will always find some thing in which he is interested, it may be his dog, his playthings, his school or school-mates, or tell him a story which arouses his interest or imagination. Have a little talk with him, but it is better not to attempt work of any kind at the first sitting.

I very often have the mother bring the child when she is having her teeth attended to, and in this way the little one becomes acquainted both with the operator and the surroundings. Then when his teeth require treatment, little trouble will be experienced, and before long the little one will march up to the office unaccompanied.

The essayist also says, that deceit should not be tolerated, and in this I heartily agree. I have heard mothers tell deliberate lies in order to persuade the child to submit to some operation, and in such cases I have asked the mother to retire to the waiting room, while I look after the interests of the child, and before long the average little patient will agree to anything within reason. I have seen many of these small patients submitting to operations which would try the nerve of many persons much older than they. Of course, there are some children who cannot be induced by ordinary means to have dental operations performed. I refer to the child who has been spoiled at home. In these cases you simply have to resort to force and compel the child to submit. But the dentist must use a great amount of judgment and study of human nature, in order to be able to discriminate between the different natures of those who are presented for treatment.

As to the filling materials to be used, I may say that I use gutta-percha, copper sulphate, oxyphosphate and amalgam wherever

possible. For I believe in making the work as permanent as possible, in the child's mouth as well as in the adult's.

We can do a great work by educating the parents who come to us for treatment, as to the care of the deciduous teeth, and also as to the time when the first permanent molar is expected to erupt, as many, in fact, the large majority of parents are totally ignorant of the fact that this is a permanent tooth.

I think that in giving little talks to the mother concerning the care of the teeth of the child and the necessity for regular examinations, much good will be accomplished and much suffering prevented.

I believe that our best efforts should be put forth in assisting Nature to bring about the very best conditions for the future of the child, and if we do the best possible with a minimum of pain, for the future is assured.

PYORRHOEA ALVEOLARIS.

BY A. A. BABCOCK, D.D.S., L.D.S., BRANTFORD, ONT.

All suppurative and inflammatory conditions in the mouth are not pyorrhoeal. There are many causes that will produce conditions very similar to pyorrhoea, as far as appearance goes. A piece of wooden toothpick or a seed forced into the gum at the interproximal space, or a faulty V-shaped interproximal space that catches and retains particles of food, are often productive of conditions that are suspicious, but, upon examination, prove to be something else. Then, there are constitutional disturbances which manifest themselves by a general loosening of the teeth. Now, are the after effects of these conditions pyorrhoeal, or are we to designate as pyorrhoeal only those conditions which have as their etiological factors, salivary calculus or cerumal deposits? Some eminent practitioners differentiate between interstitial gingivitis and pyorrhoea alveolaris, and claim that where there is no puss there is no pyorrhoea. Yet one seemingly follows so naturally as a result of the other, that it seems as if there must be some connection between them. Some divide the cause under two heads,—local and constitutional; those of a local nature being anything that will produce a local irritation, and those of a constitutional nature, being caused by an improper elimination of the waste products. Gastro-intestinal fermentation is directly attributable to faulty elimination and auto-intoxication.

An authority of an extreme faction will tell you that it is wholly systemic, and a man of the other extreme will say that it is purely local, and that there is no constitutional connection. But the man that tells you it is the result of both is probably nearer the truth. But which is the first factor at work? There are many local

conditions that are known to precede this disease,—conditions that affect the individual tooth, and conditions that affect the entire denture.

If it is systemic only, why is it that when absorption of the alveolar walls has taken place, and the teeth, consequently, are soon after exfoliated, that a spontaneous cure of the suppurative condition seems to take place? This is not a systemic action, except in the sense that the body, as a whole, has lost one of its most valuable adjuncts. But, although the circulatory system supplies the nourishment to the part that it may have the vitality to protect itself and throw off that which has become a foreign substance, this action is local and the result is purely local. Is the cause purely local? Why is it that at times there is a strong and viscid odor, and at other times there is but little? This takes place without any change in the amount of attention that a patient will give the part. Possibly by an extra amount of attention to massaging the gums, the tissues may be enabled to throw off some of their diseased condition and protect themselves from the inroads of fresh congestion, to a certain extent. If this be the case, is not the condition as much systemic as local? The result is local beyond a doubt, but what about the cause of the result?

In some mouths in which we are doing work almost continuously, and to which the patient is giving a reasonable amount of attention, there is a gradual wasting away of the process and soft tissues, without any hypertrophy of the gums, soreness to pressure or stain or deposit, but upon extraction there is found upon them where it was hidden from sight, areas of dull greyish color, indicating the presence of bacteria. This may sometimes be forced from under the gum in a thick, cheesy, mucoid condition. How are we going to treat this condition, and is the cause purely local?

There is another form, in which there is a copious flow of pus; the gum is sore and the teeth very painful to pressure.

Where there is much salivary calculus, there is, as a rule, quite an amount of hypertrophy of the gums and not the same secretion. When the secretion changes and becomes thinner, the tartar above the gums gradually disappears and there is, of course, a slight lessening of the hypertrophy, owing, no doubt, to the lessening of the irritation. What causes this change at this stage? Is it local or constitutional? Is it a change in the secretion of the glands that is not favorable to the depositing of the lime salts, or is it a change in the tissues themselves that enables them to throw off a secretion that is the means of dissolving the deposit that is already there, and neutralizes that which is secreted later?

A word or two with respect to local causes,—anything that tends to collect food or injure the tissues, the most common being salivary calculus and food debris, which collect around the necks of the teeth. When food collects around the gingival margin of the gums and, gradually undergoing chemical changes during

decomposition, the result is an inflamed, irritated condition of the gums. Where the vitality of the tissues becomes sufficiently reduced, pus is formed, and we have a well-defined case of pyorrhoea, which, if it progresses far enough will occasion a necrotic condition of the alveolus. Failure to remove this necrossed condition, will sometimes result in a continued discharge of watery secretion, even after the tooth has been exfoliated or extracted. If there is no necrosis there, the extracting of the tooth puts an end to the discharge.

This discharge occurring after treatment or extraction, has led many of our practitioners to believe that the condition is systemic, whereas it is really but a result of faulty instrumentation, or the strong tendency on our part, after an extraction, to let Nature take its course. In other words, to extract the tooth and "let her rip!"

Malocclusion is a very strong factor in causing pyrrhoeal conditions. It causes improper mastication of food and V-shaped spaces between the teeth that gather particles of food and retain them until they are so softened by fermentation that they dissolve away.

Rough approximal fillings are another cause of uncleanness, and make it difficult for patients to keep their mouths in an hygienic state.

The different causes and the different stages in which the condition presents itself, will determine the nature of the treatment to be used. In all cases of the complete destruction of the supporting alveolar tissue, the teeth are inevitably destined to extraction or exfoliation.

The possibility of permanent tightening of the teeth when treated for this disease, will depend upon the amount of destruction of the pericementium and the support continued to be given by the aveolus.

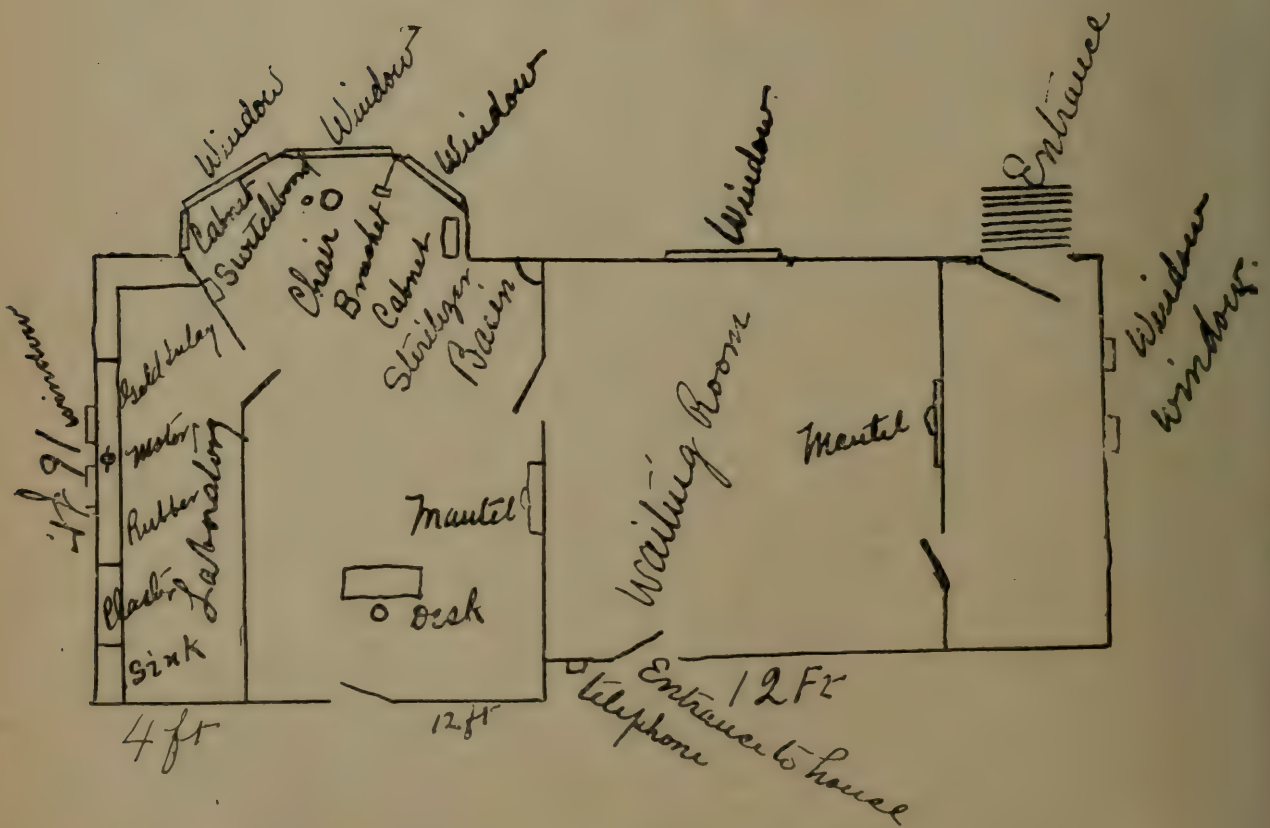
While the soft tissues may be induced to tighten and turn in and support to a certain extent, yet the alveolus, once destroyed, will never be reproduced.

Mechanical means, such as splints (if they do not detract from the cleanliness of the part) may be used to aid the surgical and therapeutical work.

The treatment may be divided into three parts, namely, surgical, therapeutic and prophylactic,—the surgical pertaining to the removal of deposits and necrossed bone, roots that may need amputating, or the removal of some of the affected teeth. The therapeutical treatment will consist of the use of astringents, antiseptics, counter irritants, tartar solvents, etc., as may be indicated. The prophylactic treatment will comprise such washing, massaging, etc., at regular intervals, as are indicated by the dentist, supplemented by the attention which should be given to the mouth by the patient, and without which all the work will be useless.



Operating Room, Dr. Babcock's office, Brantford.



Plan of Dr. Babcock's office.

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DENTISTRY IN PROVINCIAL ASYLUMS.

In the majority of institutions in charge of the Provincial Government, the teeth are attended by the local dentists. The only attention the non-paying patients get is from the physicians in charge. This consists in the extraction of teeth only. At the hospital for the feeble-minded, there has been no inspection of the teeth of the patients. The assistant superintendent giving what relief he can by extraction. The inmates of the Central Prison receive no dental attention.

The patients in the hospitals for the insane in Toronto, Mimico, and the Mercer Reformatory, are regularly attended by Dr. Wells. An appropriation has been made at Kingston, providing for a dentist.

While a good deal is being done, much more should be done to relieve those suffering from disease of the teeth, while they may be suffering from a temporary insanity. It is to be borne in mind that many cases of insanity are due to local irritations, such as impacted teeth and infected pulps of teeth. A uniform and systematic policy should be established. A regular appointee might

be made to the staff, who would spend a week or so in each institution, giving what help he could to the patients, and at the same time give instruction to the nurses and attendants in the care of the mouths of the patients. He would be available for consultation with the regular staff. All acute cases occurring in his absence would have to be attended by a local dentist. Another plan would be to have a local dentist appointed, who would visit the institution at regular intervals.

AN ACT TO PROHIBIT THE IMPROPER USE OF OPIUM AND OTHER DRUGS.

The Hon. MacKenzie King, Minister of Labor, has introduced in the House of Commons a Bill to prohibit the improper use of dangerous drugs. Among the drugs mentioned are several which are commonly used by dentists, namely, opium, cocaine, morphine, and some of the coal-tar products. It will be noted that the dentist is privileged to order or prescribe the drugs he requires in his practise. The Ontario legislature in any of its Acts, does not recognize the dentist. According to the Ontario Liquor Act, only a physician can order or prescribe liquor. A dentist is not permitted to order whiskey from a druggist, for use in his practise. In local option districts this is a hardship. The Education Act does not permit a dentist to issue a certificate to a teacher for illness. The Dominion Parliament seems freer in such matters. Below is the essential part of the new Bill:—

“Any person who deals in drugs, who gives, sells or furnishes any drug to any person other than a duly authorized and practising physician, veterinary surgeon or dentist, or to a druggist carrying on a business in a bona fide drug store, or who neglects to make or preserve a proper record in a suitable book of the name and address of the physician, veterinary surgeon, dentist or druggist to whom he gives, sells or furnishes any drug, and the date of such sale; and any druggist who gives, sells or furnishes any drug, except upon a written order or prescription signed by a duly authorized and practising physician, veterinary surgeon or dentist, or who, without the authority of the prescribing physician, veterinary surgeon or dentist, uses any prescription to sell any drug on more than one occasion, or who neglects to make or reserve a proper record in a suitable book of the name of the physician, veterinary surgeon or dentist, signing such order or prescription, the date of filling the order or prescription, and in the case of a prescription, the name of the person for whose use the prescription was granted, or refuses to allow such record to be examined by any police officer, shall be liable, upon summary conviction, to a fine not exceeding two hundred dollars and costs, or to im-

prisonment to a term not exceeding three months, or to both fine and imprisonment.

“Any physician who signs any prescription or order for the filling of which any drug is required for medicinal purposes, or is prescribed for the medical treatment of a person who is under professional treatment by such physician, and any dentist or veterinary surgeon who signs any order for any drug, unless such drug is required for medicinal purposes in connection with his practise as dentist or veterinary surgeon shall, upon summary conviction, be liable to a fine not exceeding two hundred dollars and costs, or to imprisonment for a term not exceeding three months, or both fine and imprisonment.”

A DENTIST APPOINTMENT.

The Board of Education of the city of Toronto, has appointed a dentist to the staff of the medical inspection staff. The dentist's duties will not be the same as the medical inspector's. In fact, he is not a dental inspector, nor yet a dental examiner. He is a consulting dentist, who will consult with the nurses on the staff concerning cases reported to him. He will consult with the physicians on the staff, on cases difficult of diagnosis. He will address the teachers, direct the nurses in his department. Instruct the pupils in oral hygiene, and the prevention of decay of the teeth.

It is believed that more good can be done in this way, to prevent decay of the teeth and acute infectious diseases, than by employing a dentist to examine the children, or attempting to care for them. In connection with the scheme, school clinics will be established to care for those who cannot afford to pay regular professional fees.

DENTISTS' CERTIFICATES TO BE ACCEPTED.

The education Act of the Province of Ontario, permits teachers to be sick for a period of not more than four weeks in any one year without loss of salary, provided they present a certificate from a duly qualified physician, stating that such an illness occurred. It is a fact that many teachers have been incapacitated for their duties by an illness due to their teeth, and yet the dentist's certificate could not be accepted by the School Board. Usually the teacher asked the dentist to send a certificate to her physician, stating the case, and the physician then sent his certificate to the School Board. This, of course, cost the teacher the physician's fee, while as a matter of fact the dentist's certificate was accepted.

During the session of the Legislature of 1911, the Legislative

Committee of the Board of Directors consulted the Minister of Education, concerning a change in the Act. The Minister informed the committee that it was then rather late in the session, but to bring the matter to his attention early in 1911. The matter has been brought to his attention, and he has given the deputy Minister instruction to have such an amendment to the Act as will permit Boards of Education and Trustees to accept a dentist's certificate of a teacher's illness. There is little doubt but it will get the assent of the House. In many railway and other corporations who employ a large number of people, a dentist's certificate of illness is accepted.

Whatever plan is thought best, there is no doubt as to the need of an improvement.

FILL CHILDREN'S TEETH.

Just at the present time there is a wave of public dental education passing over this continent. It will do a great good. But the dental profession must do its part. There are many dentists sacrificing time and money to help the movement along. While there are others dragging back all they can. This is what must be expected in all walks of life. There are dentists in Canada spending from one to three hours daily in preparing and delivering lectures on the care of the mouth, advocating proper brushes, sane mouth preparations, clean teeth, healthy gums and regular dental care of all mouths. They are especially advocating the proper care of children's teeth. In some cities nurses are going the rounds of the public schools reporting cases needing dental attention.

In the face of all this there are dentists who do not believe in caring for children's teeth. The very first blow to a complete dental examination and treatment of the public school children of this country, will come from the dental profession. Dentists will be the first to stop the wave of dental enthusiasm, because of their self-interests and ignorance. It is more profitable to the dentist to allow teeth to decay, and fill, crown or bridge them than to prevent decay. It is more profitable and less exhausting to work for adults than for children. There are those who really know no better than to advocate the premature extraction of the temporary teeth, or refuse to fill them, because they are going to be lost some day and be replaced by others. Upon this same argument many permanent teeth have been lost. Dentists in the past have educated the public to the idea that the final state is one of artificial teeth; so they may as well be lost now as later. Upon the same argument we might as well die now as later.

In the city of Toronto the nurses in the public schools, have

frequently sent children to their family dentist to have their teeth filled or cared for, only to be returned to school with the statement that the decayed teeth were temporary ones, and that the dentist did not believe in filling them. It is this very thing which is going to nullify the efforts of the few.

DOMINION DENTAL COUNCIL OF CANADA.

BALANCE SHEET—NOVEMBER 30th, 1910.

ASSETS.

Bank balance	\$138 93
Estimated valuation of books, stationery, printing, and office fixtures	200 00
Examination fees outstanding:—	
Blatchford, F. W.	\$10 00
Sisson, E.	10 00
Ives, E. J.	10 00
Cation, J. M.	10 00
Dunning, J. N.	10 00
Vance, R. J.	10 00
Fisher, R. E.	10 00
McComb, C. A.	10 00
Rodgers, W. R.	10 00
Young, E. L.	10 00
French, R. W.	10 00
McLean, R. M.	10 00
	120 00
Grady, T. P., account outstanding, May 22, 1908	100 00
	\$558 93

LIABILITIES.

Examination fees paid in advance:—	
Richard, H. B.	\$ 5 00
Grist, P. K.	5 00
Higginson, T. D.	5 00
Howden, E. N.	5 00
Hughton, J. M.	10 00
Brett, A. J.	15 00
Downing, F. L.	5 00
Gilroy, W. H.	10 00
Madill, W. S.	5 00
Wright, C. J. E.	9 00
Highley, E. A.	5 00
Bass, L.	5 00
Simmons, H. A.	5 00
	\$85 00

Abbott, H. R.	6 00
Secy-Treasurer, salary	300 00
Perring, Taylor, auditors' charges	39 25
Dr. W. D. Cowan, in payment of petty disbursements	26 57
Surplus	102 11

\$558 93

Audited and found correct,

Auditor.

BALANCE.

To Balance carried forward, May 22, 1908	\$ 45 77
Registration and examination fees	4140 00
	<hr/>
	\$4185 77

DILBURSEMENTS.

By Examination fees	\$1247 68
Delegates' expenses and subsistence allowance in connection with meeting of Council	1327 35
Printing, engrossing, and stationery	363 90
Advertising	3 15
Salary, Sec.-Treas.	600 00
Fees returned to applicants	339 65
Interest on bank overdraft, and exchange	1 20
Postage	45 16
Telegrams and Telephone	21 35
Express	38 60
Petty expense, sundries	12 10
Over deposited in bank by Sec.-Treas.	16 70
Honeyman, J. R. C.	30 00
Balance at bank	\$159 83
Less outstanding cheque (Abbott, H. R.) ..	20 90
	<hr/>
	138 93

\$4185 77

Audited and found correct,

Auditor.

TO LET—An up-to-date Dental office to let, corner Queen and Simcoe. M. 1621.

APARTMENTS TO RENT—\$25 Three-room suite with sink, etc. First class location for dentist, over store on Parkdale's busiest and most prominent Queen St. corner, separate entrance, will lease. F. G. Martin, corner Queen and Macdonell, evenings 159 Macdonell.

Editorial Notes

Do you tell parents that their children's temporary teeth need not be filled?

Dr. N. S. Coyne was elected a member of the Board of Education of Ridgetown.

Teeth do not decay more rapidly in one person than in another because the enamel is softer.

Dr. T. R. Paterson, Almonte, Ont., was elected school trustee by acclamation for ward three.

Dr. R. E. Sparks, of Kingston, addressed the local Y.M.C.A. on January 19th, on the care of the teeth.

Dr. J. A. Ross has located in Cochrane, Ontario. He was formerly with Dr. Wickett, North Bay.

The dentist who does not use Price's stone in inlay work does not take full advantage of the inlay process.

Dr. Mark G. McElhinney, Ottawa, has invented a machine for the relief of pain. It will also produce sleep.

Gutta percha is a failure near a vital pulp. With few exceptions pulps die under gutta percha capping or protection.

Dr. Dickson, Perth, N.B., is at the head of a local company which is travelling through Maine putting on a Military play.

Dr. A. E. Webster, delivered an address on care of the mouth in the auditorium of the Collegiate Institute, Hamilton, on Jan. 16th.

Dr. J. G. McDonald, New Glasgow, N. S., has moved into a new dental office, which is equipped with all modern appliances.

Newspapers repeat the story of the third set of teeth as a wonder article. Somebody should suggest a few truthful wonders for them.

Have you ever noticed how valuable a few decreped teeth become to an old patient. Isn't it a lesson to the dentist or the young person?

Dentists who fill root canals with cement, amalgam or oxy-phosphate of copper, should be compelled to remove such fillings when trouble arises.

Gutta percha is a poor foundation for an amalgam filling. The gutta percha forming a root filling should be covered with oxy-chloride and oxy-phosphate.

It is unwise to predict when teeth will be lost from pyorrhea, because the patient might chance to fall into the hands of a real dentist who would care for them.

The Dental Association of Manitoba has granted licenses to M. C. Clark, W. E. Emmons, and J. A. McCausland, of Winnipeg, and R. H. Robertson, Portage La Prairie.

It makes little difference what has been proven about the uniform constituents of the enamel of the teeth, dentists will persist in telling patients that their teeth are too soft to fill.

Even though it has been demonstrated scores of times that infection will pass through a crown and root filling and infect the tissues at the apex, and that such infection will not occur if the root filling is covered with oxchloride of zinc, few dentists make a practice of doing it.

Did you ever try to solder two pieces of metal in a certain relation to each other over a busen flame and in drawing them away to cool they become displaced. Sure you have. Well don't draw them away, blow the flame to one side until they cool, and then no movement is necessary until the solder is set. Try it.

In this issue appears an article on equine dentistry which is of special interest to dentists. Magazines on general subjects, and newspapers often contain real wonder articles on equine dentistry. There are long descriptions of how to fill horses teeth with gold. As a matter of fact very few veterinaries in a lifetime practice every see an example of dental caries. There are no instruments manufactured for filling horses' teeth.

Dr. J. G. Coram, of Drayton, is now practicing in Toronto.

Dr. Newton, Lucknow, Ont., does not visit outside places any more.

A set of defective teeth are about as useful to their owner as a saw which has lost its teeth.

The Royal College of Dental Surgeons held their annual "At Home" in the College building, January 27, 1911.

The G.V. Black Dental Club, of St. Paul, Minn., held their mid-winter clinic in St. Paul, on Feb. 16th and 17th, 1911.

Dr. J. J. McPherson, who has been practicing in Paris for the past ten years, has sold his practice to Dr. Barron, of Hamilton. Dr. McPherson expects to go to Edmonton to practice.

On February 1st, the firm of the Imperial Rubber works was changed to E. J. McCormick Rubber Company, the management remains the same as formerly, also the address, 26 West Broadway, New York.

Dr. Roberts, Medical Health Officer, Hamilton, Ont., says there is a close relationship between bad teeth and tuberculosis.

The Winnipeg Telegram suggests that the Board of Education of that city inaugurate medical inspection of the children of the public schools.

The dentists of Brantford have proposed

to the Board of Education that they would examine the teeth of the children for a year, but their proposition has not yet been accepted.

The Court of Appeal, of Ontario, has handed down judgment in the case Dr. F. W. Gordon and J. W. Bushnell vs. Royal College of Dental Surgeons. The By-laws have been sustained. A dentist's license may be cancelled by the Board for unprofessional conduct.

The Lloydminster Times, Sask., says: Most people have experienced what is commonly known as "teeth set on edge."

One explanation is given that the acid of the fruit that has been taken has so far softened the enamel of the tooth that the least pressure felt by the exceedingly small nerves which pervade in thin membrane connecting the enamel to the bony part of the teeth.

When the effect of sour fruit on the teeth subsides they feel as well as ever, but they are not as well, and the oftener it is repeated the sooner the disastrous consequences will manifest themselves.

Therefore it is wise to rinse the teeth promptly and thoroughly with an alkaline wash. Simple lime water is sufficient to neutralize all such acid and the teeth cannot then decay from this cause.

Prepared chalk and powdered orris root make a good tooth powder for general use.

Proceedings of Dental Societies

BRANT COUNTY DENTAL SOC'Y

The Brant County Dental Society met on Wednesday, January 11th, and spent a social evening together. Mr. Leighton, of Leighton & Jackes, happening to be in the city, gave a brief talk to the members on Dental Electrical lines, and answered questions with regard to the care of their electric equipment. This was appreciated very much, as much can be learned from a per-

sonal talk that cannot be obtained from printed instructions.

The annual clinic of the Alumni Association of the St. Louis Dental College, will be held in the College building, Grand Av. & Caroline Street, Saturday, April 15th, 1911. All ethical practitioners are cordially invited to attend. Virgil Loeb, President; Francis P. Mahon, Secretary.

Preliminary and Professional Educational Requirements of Provincial Dental Board of Nova Scotia.

Preliminary Requirements to come in force on and after August 15th, 1911.

Professional Requirements to come in force on and after March 15th, 1911.

Approved by the Governor in Council.

NOTICE.

Under the provisions of "An Act Relating to the Practice of Dentistry" (Chapter 105, R. S. 1900 and subsequent amendments), the Provincial Dental Board of Nova Scotia is empowered to establish, change, or amend from time to time the Standard of Preliminary or Matriculation Examination to be passed by Dental Students, to prescribe the course of study to be pursued and length of such course, final examinations and all other particulars respecting the practice of Dentistry in Nova Scotia. Provided that such curriculum and requirements have been approved by the Governor in Council and by the Association (Chapter, 105, R. S. 1900 Section 11 & 13, Section 17, sub. sec. 2).

In accordance with the above authority, recommendations were made by the Provincial Dental Board and resolutions passed by the Nova Scotia Dental Association at the annual Convention held at Sydney, Cape Breton, July 7th and 8th, 1909, authorizing certain changes and amendments to the standards of Preliminary and Professional requirements. The full text was submitted to the annual meeting of the Dental Association held in Halifax, July 14th and 15th 1910, and presented to the Governor-in-Council, August 12th, 1910, approved.

The professional requirements in these regulations come in force on and after March 15th, 1911. The preliminary educational requirements come in force August 15, 1910. Students who are preparing for matriculation under the present requirements must pass the examination before that date.

The regulations are hereby published for the information and guidance of Dental

students and the profession generally, careful perusal is requested.

Throughout these regulations the masculine pronoun is to be read as standing for candidates irrespective of sex.

For dates of examinations and further particulars apply to

George K. Thomson, D.D.S.,
Sec'y Registrar Provincial Dental Board,
Chronicle building,
Halifax, Nova Scotia.

THE MARITIME DENTAL COLLEGE.

This Institution is conducted by the Provincial Dental Board of Nova Scotia. It is affiliated for teaching and examination purposes with Dalhousie University and the Halifax Medical College.

Preliminary and Matriculation Qualifications.

The Maritime Dental College does not conduct Preliminary or Matriculation Examinations.

Before being registered in the Maritime Dental College all intending students from Nova Scotia must present certificates of matriculation from the Provincial Dental Board.

Students from other Provinces in Canada, or other countries, must present such Certificates of Preliminary education or Matriculation as are specified and accepted by the Dominion Dental Council of Canada, or by the Province in Canada in which they are regularly registered as Dental students.

DOMINION DENTAL COUNCIL*

The Dominion Dental Council of Canada is a central organization under the control of the profession of Canada. Its object is to erect and maintain a standard of education and ethics for the dental profession, and to conduct professional examinations and issue Certificates of Qualification,

*For information concerning the requirements of the Dominion Dental Council, apply to Dr. W. D. Cowan, Secretary of the Dominion Dental Council, Regina, Sask., or to the Dental Registrar of any Province.

which shall be accepted without further examination by the provinces.

For Calendar and further particulars apply to

Frank Woodbury, D.D.S., Dean,
192 Pleasant Street,
Halifax, Nova Scotia.

QUALIFICATION FOR MATRICULATION OF STUDENTS IN DENTISTRY IN NOVA SCOTIA.

1. A Candidate for admission to the Preliminary Examination must give fourteen days notice previous to such examination to the Secretary Registrar of the Dental Board, of his intention to present himself for such examination, produce satisfactory evidence that he has attained his sixteenth year, that he is a person of good character, and has paid a fee of Ten Dollars (\$10.00) to the Secretary Registrar.

11. The Preliminary Examination will embrace the following subjects, viz:—

(1) English, (a). Language, Grammar, Analysis, Parsing. (b). Rhetoric and Composition, including an essay on one of several set subjects from prescribed authors.

(2) Arithmetic. Complete.

(3) Algebra, Simple Rules; Rules for the Treatment of Indices; Surds; Extraction of Square and Cube Root; Equations of the First Degree; Quadratic Equations.

(4) Geometry, Euclid, Books 1, 2, and 3, with easy deductions.

(5) History and Geography. British and Canadian History with questions in General Geography.

(6) Latin, (a) Translation from prescribed books, with questions arising out of these books, and translation of easy passages not taken from these books.

(b) Grammar, including Accidence and Elementary Syntax. (c) Composition in translation of easy sentences from English into Latin.

(7) One of the following:

Greek, (a) Translation from prescribed books, with questions arising out of these books, and translation of easy passages, not taken from these books.

(b) Grammar, including Accidence, and Elementary Syntax.

(c) Composition in translation of easy sentences from English into Greek.

French. Translation from prescribed books, with grammar questions limited to the Accidence and easy rules of Syntax, and based upon the passages selected for translation.

German. Translation, Grammar, etc. as under French.*

III. Examinations take place in Halifax twice a year in the months of May and August. On the same dates local examinations may be held on application at Sydney, Pictou and Yarmouth.

Candidates taking local examinations are required to pay an additional fee of two dollars (\$2.00).

IV. Unless otherwise specified the books prescribed by the Council of Public Instruction for the course leading to the Grade "B" or High School Junior Examinations are recommended.

V. In order to pass, a candidate must make fifty percent. of marks in each of the seven subjects as above prescribed. If fifty per cent. be made in all subjects but one, and if in that subject the candidate shall have at least twenty-five per cent, he may thereafter present himself for examination in that subject alone upon payment of a fee of Two Dollars (\$2.00).

VI. Candidates taking local examinations will be required to pay the usual additional \$2.00 fee for such examination.

VII. A candidate failing in more than one subject, or failing to make twenty-five per cent. in any subject will be required to appear again for examination in all subjects. Fee for examination for such case will be Five Dollars (\$5.00), or Seven Dollars (\$7.00), if a local examination be taken.

VIII. Certificates will be issued to successful candidates showing the subjects in which they have passed, and the extent to which their knowledge of these subjects was tested.

*Dates for Examination, 1st Thursday in May and last Thursday in August.

*English Authors for 1911,—Shakespeare, Julius Caesar, Macauley, Addison, Kingsley, Hereward the Wake.

Latin for 1911—Caesar, *De Bello Gallico*, Book 1, with Virgil *Aeneid*, Book 1.

Greek for 1911—Xenophon, *Anabasis*, Book 1.

French for 1911—Berthon, *Specimens of Modern French*, Prose omitting 4, 6, & 10 and A. Travers le Canada (*Quatrieme Livre de Lecture*.)

German for 1911—Buckheim, *Modern German Reader*, Part 1 Complete.

EXEMPTIONS.

IX. Graduates in Arts or Science of any recognized College or University are not required to submit to this examination provided the candidate shows that he has passed a satisfactory examination in Latin; and in Greek, French or German.

X. The Dental Board will also recognize pro tanto the following examinations:

(1) The Matriculation or Sessional Examinations of any Chartered University or College approved by the Board.

(2). The Final or Graduating Examinations of the Collegiate Schools or Academies directly connected with Acadia University, Wolfville, N.S., Kings University, Windsor, N. S., Mount Allison University, Sackville, N. B.

(3). The Entrance Examination of the Nova Scotia Barristers Society.

(4). The examinations for Teachers' Licenses, Grade A. or B. Nova Scotia.

(5) The examinations for Junior High School Leaving Certificates for Nova Scotia.

(6). The examinations for Honour, First or Second Class Ordinary Diplomas, as issued by the Prince of Wales College, P.E.I.

(7). The examinations for First or Second Class Teachers' Licenses of Prince Edward Island.

(8). The examinations for First Class, or for Grammar School License of New Brunswick.

(9). The examinations for corresponding Licenses or Leaving Examination Certificates issued by the Education Department

of the other Provinces of Canada and of Newfoundland.

(10). The Matriculation or Preliminary Examination of any Medical Licensing Board or Council authorized by law in His Majesty's Dominions.

Note. In accepting certificates under the above Sub-section 2-10 inclusive, the same per cent will be required in each of the seven subjects of the examination specified in Section 2—as may be required by Dalhousie University or the Halifax Medical College.*

The Dental Board will accept the Matriculation Standard set by the Dominion Dental Council.*

This Preliminary or Matriculation qualification shall come into force August 15th, 1911, but shall not apply to students who have begun their studentship previous to that time.

1—REQUIREMENTS FOR LICENSE TO PRACTICE DENTISTRY IN NOVA SCOTIA.

A candidate for License to practice Dentistry must qualify as follows:

(a). He must be the full age of twenty-one years.

(b). He must forward to the Secretary Registrar fourteen days before examination.

(1). A written application for examination, accompanied by a satisfactory certificate of character.

(2). The License fee of Twenty Dollars (\$20.00) must be paid before the examination takes place.

(3). The Matriculation Certificate, Diploma, Class Tickets, and any other vouchers considered necessary.

(4). A written statement from himself and attested certificate from preceptor or preceptors as to length of time in months he was studying under his or their direction. Blanks will be supplied by the Secretary-Registrar for this purpose.

*Certificates (except Grade xii) issued by the Education Department of 1911 and subsequent years, a mark of at least 60 per cent. will be required in each subject.

Dominion Dental Council of Canada for the purposes of matriculation.

Dalhousie University, Matric. Exam. (Arts).

University of Kings College, Matric. Exam. (Arts).

Provincial Medical Board of Nova Scotia, Prelim. Exam.

University of New Brunswick, Matric. Exam. (Arts).

College of Physicians and Surgeons of N. B., Matric. Exam.

University of McGill College, Matric. Exam. (Arts).

College of Physicians and Surgeons, P.Q., Matric. Exam.

University of Toronto, Matric. Exam. and Departmental Arts Matric. Exam.

Trinity University, Departmental Arts, Matric. Exam.

Trinity Medical College, Toronto, Dep. Arts Matric. Exam.

Queen's University, Dep. Arts, Matric. Exam.

Victoria University, Dep. Arts Matric. Exam.

College of Phy. and Surg., Ontario, Dep. Arts Matric. Exam.

Western University of Ontario, Dep. Arts Matric. Exam.

University Manitoba, Prelim. and Previous Exams.

Newfoundland Medical Board, Prelim. or Matric. Exam.

Prelim. Exam. of, or Matric. into any Institution in Great Britain or Canada recognized for the purpose of Matriculation in Medicine or Dentistry by the General Council of Great Britain.

(5). He shall pass an examination before the Board of examiners on the subjects usually included in a Dental Education, and shall perform operations in the mouth and give practical evidence of skill in Prosthetic Dentistry which shall be satisfactory to the Board.

II—TERMS OF STUDENTSHIP.

The term of studentship for practice of Dentistry in Nova Scotia shall be 4 regular winter sessions in a recognized Dental College, the curriculum of which required four Academic years of studentship before grad-

uation, which shall aggregate a minimum of thirty months actual attendance before receiving a Diploma.

III—For a person who is a graduate of a Dental College recognized by the Provincial Dental Board, which requires less time than four years and thirty months attendance, the term of studentship shall be thirty-six months. The extra time over and above the months in College shall be spent in bona fide studentship under a registered Dental practitioner in Canada, in which case the student shall file a certified copy of his contract with his preceptor in the office of the Secretary Registrar of the Provincial Dental Board of Nova Scotia, or he may take the final year in a recognized Canadian Dental College. Upon receiving his diploma he will be eligible for examination under the regulations of the Dental Board.

IV—Professional examinations shall be held twice during the year, in April and September respectively.

V—In all examinations the pass mark shall be fifty per cent. in each subject; provided that in case of failure the candidate who obtains fifty per cent. in any subject or subjects, will on re-examination be exempted in such subject or subjects, but will be required to obtain sixty per cent. in each of the remaining subjects.

VI—No candidate shall be admissible to examination who has been rejected in the subjects of the examination by any other licensing Board within the three preceding months.

VII—Applicants for admission to the examinations are required to lodge with the Secretary Registrar a schedule (forms of which will be supplied) showing the courses they have attended, qualifying for admission.

VIII—All candidates for registration in Nova Scotia must take the prescribed professional examination, subject to the rules and regulations of the Dental Board, provided that students of the Maritime Dental College of Halifax who pass the sessional and final examinations held by the Faculty of Dentistry of Dalhousie University, and who have received a Diploma will be exempted from the professional examination

of the Provincial Board, and if all other requirements of the Dental Board are fulfilled, the candidates shall receive a certificate of Registration to practice Dentistry in Nova Scotia.

The Dental Board shall accept persons holding the certificate of Qualification of the Dominion Dental Council of Canada, for registration without examination providing that all other qualifications imposed by the Board are met (Chapter 42, Acts 1907).*

These professional requirements for registration shall come into force and apply to all candidates on an after March 15th, 1911 Provided: that persons who are registered as Dental Students in Nova Scotia and have begun their College course before

the approval of these regulations by the Governor-in-Council, shall be exempted from the professional examinations. (Cap. 105, R. S. 1900 Sect. 11).

All previous regulations relating to Matriculation and Registration are hereby rescinded.

*Any Candidate for registration as a practicing Dentist in Nova Scotia who produces to the Secretary Registrar satisfactory certificates of having passed in some Dental College or University recognized by the Dominion Dental Council of Canada in the following subjects may be exempted from further examination upon such subjects. Anatomy, Chemistry, Biology, Physics, Histology, Physiology.

PACKING AMALGAM.

The first requisite in packing amalgam is to have the cavity thoroughly dry and to keep it so until the completion of the operation. Secondly, the amalgam must not contain too much mercury, as it hinders the proper packing. Thirdly, the proper instruments for inserting packing are necessary. In packing amalgam a fairly large plugger is necessary, and suitable to the shape of the cavity. The amalgam is placed on a clean slab and cut into small pieces. One of these is carried to the cavity by a Willmott's spoon, and inserted. With a plugger it is thoroughly packed into the bottom of the cavity, until all excess of mercury is squeezed out which may be removed if necessary, by a piece of gold foil, to which the mercury adheres. This operation is continued until the cavity is packed thoroughly, and to the required outline. The main thing is to "pack" it until you know it is one homogeneous mass, without interspaces filled with air.

CASTING GOLD ON PORCELAIN.

At last I have been successful in casting against porcelain without checking. I use a flask, the dimensions of which are one and one-quarter inches in diameter and the

same height. After coating wax with silex and plaster, I fill balance of flask with Brophy's imperial investment compound, and after drying I place in a coal stove and leave till it is all red hot. Then it only takes a few minutes to melt gold and force home, and as there is quite a body of investment around the tooth, it has not time to cool before the gold comes in contact with it. I have made a four-tooth bridge by this method, and all facings were intact.—E. Cunningham, Parry Sound, Can. —Dental Review.

DENTAL INSPECTION SCHOOL CHILDREN, STRATFORD, ONT.

Drs. J. A. Beatty and J. A. Bothwell, reported on dental inspection of school children in Grade 7, Romeo School, as follows:

There were 35 in all, 14 girls and 21 boys, ages from 11 to 14. We found the soft tissues of the mouth in a normal condition in nearly all cases. The tabulated result of examination: Power of mastication, 19 good, 15 fair, 1 poor; permanent teeth, present, 858; temporary 58; permanent lost, 9; filled, 5; cavities in permanent teeth, 77; in temporary, 24; in first permanent molars, 49; first permanent molars

lost, 7 ; defective teeth, 101 ; abscesses, 3 ; pus exudations, 2 ; suffering pain, 4.

Drs. E. H. Eidt and A. A. McKenzie reported that they had examined 31 children in form 3 of the Shakespeare school, 14 male and 17 female, condition as follows : Malocclusion (upper and lower teeth do not meet properly) 17 ; power of mastication, 10 good, 12 fair or bad ; condition of mucous membrane, 29 good, 2 fair ; mouth clean, 5, fair 25, unclean, 1 ; number of permanent teeth present, 493 ; temporary, 182 ; permanent teeth lost, 2 ; temporary teeth prematurely lost, 46 ; permanent teeth, filled, 2 ; temporary teeth, 2 ; cavities in permanent teeth, 47 ; in temporary, 94 ; first molar cavities, 36 ; filled, 2 ; lost, 2 ; abscesses, 4 ; pus exudations, 2. We found only one perfect set of teeth in the 31 children.

Dr. Eidt said that it could be seen from reports that there was room for considerable work medically and dentally. The swollen glands indicated tuberculosis. The Medical Health Officer, of Chicago, had reported that attention of the teeth of the children had resulted in improvement of the general health.

THE TREATMENT OF TYPHOID FEVER.

The state of the patient's mouth requires constant attention, lest from a foul condition, it become the source of infection of the mucous membranes and their lymphatic supply, the tonsils, the ears and the lungs ; and, upsetting the stomach, destroys the appetite. The teeth should be brushed two or three times a day. The mouth should be rinsed with water or boric acid solution (2 per cent. to 4 per cent.), or one of the many alkaline and antiseptic washes, after each feeding. If there is much sordes, and there are fissures, a mild antiseptic containing phenol is of value. The following is recommended :

R Phenol solution (5 per cent.)
Glycerin (. . . aa 3i ;
Saturated solution of boric acid . . . ʒviii.

M. et Sig : To be used as a mouth wash.

—New York Medical Journal

OUR HERITAGE.

This glorious land of unknown wealth,
Whose bracing air bears bounding health ;
Whose fertile plains and woodlands bold,
Dispelled the fear of toil and cold ;
And called our sires, who feared no task,
And said : "I give to those who ask,
To those who knock I'll open wide,
Come, and of me make Britain's pride."

This is our heritage.

They heard the call with drooping head,
Forsook the land where slept their dead.
With vision keen, they saw before,
A freer life, a fuller store.
We cherish still their worthy names,
Their honest purpose, noble aims,
Their blood, their faith, their courage high
Their loyalty, which naught could buy.

This is our heritage.

And shall we, sons, unworthy be ?
Forget the home across the sea ?
The mother who with travail sore,
Has nurtured well the sons she bore.
Shall we our giant strength refuse,
In Britain's need, that strength to use ?
Unworthy thought, our best, our all,
Are ready at the mother's call.

This is our heritage.

The nation calls, God hear our cry,
And grant us men, to do, or die.
No rebel heart, no traitorous hand,
Shall spread sedition in our land ;
But honest men, with single aim,
Shall guard our coast, preserve our name ;
Shall hear again the Lord's command :
"Let righteousness exalt the land."

Our glorious heritage.

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Toronto, Dec. 8th, 1910.

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Original Communications

TRIFACIAL NEURALGIA.

BY RICHARD MONAHAN, M.D., MONTREAL.

Read at the meeting of the Montreal Dental Club, December 20, 1910.

When in Rome, I had the pleasure of viewing the splendid statue of Aesculapius, and I found the God of Medicine to be a man of years, bearded, gentle, and earnest, draped, and resting on a staff, round which a serpent was coiled. Later I was curious enough to look up the mythology of the question, and I found that the serpent, by its periodic change of skin, is emblematic of rejuvenescence.

To me there is no better example of rejuvenescence than that which you gentlemen seem to be able to effect in the case of individuals who place themselves under your care, and upon whom you lavish your skill in a really remarkable manner. Truly the many beautifully built up oral cavities, which I have had an opportunity of observing in Canada and the United States, and in fact wherever you flourish, have convinced me that you are true artists, creating your work, just as the sculptor creates something that delights the eye, and illustrating the truth of the saying that a "Thing of beauty, is a joy forever." During one year, as anaesthetist of the Royal Victoria Hospital, I had, in every case, to ask the stereotyped question, "Have you any *false* teeth?" and really in many cases when the teeth had been removed, there was as complete a metamorphosis as that which takes place when the tadpole changes into the frog, only the process is reversed in the human being.

You may not have the Aesculapian coat of arms to adorn your profession, or to be able to refer to the researches of a former member of your profession, the late lamented Hippocrates, but you can point to your wells, who made nitrous oxide practicable, and to Morton, whose bust may be seen in the beautiful operating

theatre of the Massachusetts General Hospital, and who made modern surgery possible by discovering ether. Previous to this in surgery the great aim was speed—"an amputation or a lithotomy was a matter of seconds, but the seconds held the compressed agony of hours, for the knife was an instrument of torture, and the operating room a shambles." Now, however, the surgeon no longer works against time, but upon a placid sleeping patient. Moreover, while surgery is often destructive, dentistry is mainly constructive, although we revel in the same ancestry, namely, that of barbers. You have the advantage of seeing *prime facie* evidence of your work, something tangible, as it were, that one can see and touch, as well as being more or less unfettered as regards the traditions and prejudices of the medical profession, like a new school of art, so to speak. Moreover, you enjoy when fortune favors you, the surgeon's prerogative of being able to secure high fees, as may be gathered from the following episode, which I read in "Society Recollections in Paris and Vienna by an English Officer."

"An English lady went to Dr. R——, of Vienna, to have some teeth stopped, and that dentist told her after some visits that he should advise her to have two bridges made. She allowed him to make them for her, and altogether she paid him about thirty visits, when, to her astonishment, he sent in a bill for close on one hundred pounds. Unnaturally, she protested, and it nearly came to a lawsuit, but an expert was asked his opinion, and he coolly said, 'I should have charged two hundred pounds.' It appears that in Vienna, unlike Germany, a dentist may charge what he pleases."

It is not my intention to indulge in platitudes, but I can assure you that there is no one who appreciates good dental work more than myself. I once spent several months on the Island of Cape Breton, where coal is king, and all surgery is minor and yet sometimes major, and you can accept my statement that the island itself is not only full of holes, but the teeth of its inhabitants are likewise affected, and the crying need of the country is not for miners' drills, but for dental ones, and I only wish that each and every member of your profession could be transported to that benighted isle for one day and set the poor people right.

The great danger, however, which you have to contend with in your profession, is that you are to regard yourselves as absolutely separate from medicine as a whole, just as the Plebeians of old fancied they could withdraw and separate themselves from the Roman patricians, and were brought back to reason by Agrippa and his fable of the stomach and the members, although I do not use these terms in any Pickwickian sense, but merely in an allegorical one. Rather would I have you consider yourselves as specialists in medicine, and just as the oculist has to look for the ophthalmoscopic manifestations of nephritis, so in addition to the daily prophylactic exercise of your profession, you should watch for dental symptoms bearing on disease however remote..

As a subject, therefore, which I hope will prove of some interest to you, I shall endeavor to enunciate to you the subject of trigeminal neuralgia, and in order to illustrate the important part which you play in the prophylaxis of this disease, I cannot do better than to read to you the contents of a letter which I received some time ago from Dr. Frank Hartley, of New York, whom you may already know in connection with the famous Hartley-Krause operation, for the removal of the gasserian ganglion. Dr. Hartley writes as follows:—

“I still believe many operators are operating upon the ganglion when they could have cured their cases with less extreme operations. I have three cases now cured without any other operative treatment than to the teeth and jaw. More cases like these exist, and if the disease were early treated in this manner, more extensive operative procedures would not be required. Therefore you will not find in any of my cases, those which have not had other operations with failure.”

There is no doubt that Dr. Hartley's conservative attitude is the proper one: it is all very well for one to talk about the pain of neuralgia being so severe as to make patients contemplate suicide, but the surgeons should be very cautious about opening the skull, lifting up the anterior of the brain, in order to expose the gasserian ganion which is attached inferiorly, exposing the patient to sepsis, hemorrhage, subsequent paralysis of the muscles of mastication on one side, as well as loss of sensation, with the additional danger of losing the eye, through the intervention of panophtahlmitis following conjunctivitis and keratitis, for it is found that the fifth cranial nerve exercises some sort of a trophic influence on the cornea; and lastly, there is the ominous death rate of one in twenty.

Rather would I commend its prophylactic treatment to you. Just as in the case of tuberculosis glands of the neck, or a tuberculosis apex of the lungs, the source of infection may originally be carious or defective teeth, traveling along the lymph or blood channels, so inflammation beginning at the periphery of a nerve, may extend up the nerve trunk to its root-ganglion; and this is in accordance with the recently accepted ideas regarding neuralgia being due to an ascending peripheral neuritis, inasmuch as no constant pathological changes have been observed in the ganglion itself. You can therefore aid in the prevention of the disease by recognizing the starting point.

In this connection it is interesting to read Sir Victor Horsley's views in regard to the oft-recurring question of the removal of the teeth in true trigeminal neuralgia.

“In a paper I read before the Odontological Society some years ago, I drew attention to the very unnecessary disadvantage that these patients were commonly placed in by the empirical removal of their teeth, the pain being so constantly referred to the

alveolar border of the jaw, whereas, of course, the main part of the nerve is affected. This has no reference naturally to those cases where diseased teeth have set up osteitis of the jaw, and where it is absolutely essential that all the diseased teeth and stumps should be removed. I am only now referring to normal teeth, which ought never to be removed. Moreover, since I have shown before that, conversely, removal of the nerve trunks does not affect the condition of the teeth, supposing them to be initially healthy, and considering that the superficial operation gives the patient little or no inconvenience, certainly not so much as extraction of the teeth, it clearly ought to take precedence of such extraction, which unfortunately, is usually resorted to, and the patient loses his teeth without being in the least degree benefited thereby, but, on the contrary, by the loss of mastication his health is seriously impaired.

Bearing these facts in mind, we shall attempt to define the true nature of neuralgia, which is an affection of a nerve trunk in which pain is the principal symptom, without loss of power or of touch. There are many neuralgias, such as cervical-occipital neuralgia, brachial neuralgia, intercostal neuralgia, etc.; but we shall concern ourselves with neuralgia of the fifth cranial nerve, trifacial or trigeminal neuralgia, commonly known as *tic douloureux*, which is more frequent than that of any other nerve. This is partly due to the exposed position, and the complexity of the connection and distribution of this nerve. We must distinguish neuralgia from headache and migraine. The pain of headache is usually bilateral, and is more or less persistent: that of migraine is paroxysmal and unilateral, and is associated with other sensory disturbances: it passes off, leaving the patient feeling better than before, to return again at more or less regular intervals. The pain of neuralgia is shooting, and limited to the course of a nerve, along which there are often tender points (*points of valleix*).

The following are some of the anatomical points in connection with this nerve:—

The trigeminal nerve is the great sensory nerve of the head and face, and the motor nerve of the muscles of mastication.

The *intra-cranial* portion consists of the two roots, sensory and motor, together with the gasserian ganglion, which latter is simply a semilunar dilatation in the course of the larger sensory root, lying in an osteo-fibrous space, between the bone and the dura mater, at the apex of the petrous portion of the temporal bone. The motor root passes beneath the ganglion without having any connection with it. From the anterior border of this ganglion, three large branches proceed, namely, the ophthalmic, superior maxillary, and inferior maxillary divisions of the fifth cranial nerve, constituting its extra-cranial portion.

I. The *ophthalmic* is a sensory nerve. It supplies the eyeball, the lachrymal glands, the mucus lining of the eye and nasal fossae, and the integument of the eyebrow, forehead and nose. It

extends in the orbit from the inner end of the sphenoidal fissure straight outwards to the supraorbital notch, its divisional branches being the lachrymal, frontal and nasal.

II. The *superior maxillary* is also a sensory nerve. It supplies filament to Meckel's ganglion, the lining membrane of the antrum of highmore, the mucus membrane of the nose and cheek, the gums and teeth of the upper jaw, the side of the nose, the lower eyelid, the upper lip, and a limited area in the forepart of the temporal regions and over the malar bone. After leaving the skull through the foramen rotundum, it traverses the upper part of the spheno-maxillary fossa and the infra-orbital canal, from which it finally emerges upon the face through the infra-orbital foramen, breaking up into its terminal branches, the palpebral, nasal and labial. The temporo-malar, spheno-pelatine, and posterior dental branches are given off in the spheno-maxillary fossa, while the nerve gives off the middle and anterior dental nerves in the infra-orbital canal.

III. The *inferior maxillary* is the largest of the three divisions, and is made up of two roots, the smaller motor root uniting with the larger sensory root, just after its exit from the skull through the foramen ovale. The primary trunk, after giving off the nerve to the internal pterygoid muscle, divides into two trunks, anterior and posterior. The anterior division is the smaller one, and is composed almost entirely of motor fibres, supplying the masseteric, temporal and external pterygoid muscles, while the only sensory fibres which it contains are given off in the long buccal nerve.

The large posterior division, on the other hand, is chiefly sensory. It contains only a very few motor fibres, and these are prolonged into its inferior dental branches, and afterwards come off in the form of the mylo-hyoid nerve. It gives off branches of distribution to the integument of the temple and external ear, in the auriculo-temporal nerve, and to the teeth and gums of the lower jaw, and the lower part of the face and lower lip, in the inferior dental nerve and its terminal branches, as well as supplying the tongue with a large branch, the lingual.

Briefly, then, as Campbell of New York, states, the fifth cranial nerve, by means of the gasserian ganglion, controls either altogether, or for the most part, the sensory innervation of the eye, the skin of the face, the teeth, and the mucus membrane of the nose and mouth and the antrum of highmore. One can readily perceive the enormity of reflexes which may be carried to the brain along this route. It is when these reflexes become painful, that surgically we seek to inhibit the transmission of the particular impulse, or failing to do so, turn our attention to the excision of the ganglion or section of its sensory root.

The following description of the symptoms of tic douloureux is after Fagge and Pye-Smith:—

The sudden onset of the pain of tic douloureux is one of its most characteristic features. The patient is possibly sitting quietly

reading, when he jumps up from his seat, and walks up and down the room, stamping, and pressing his hand against his cheek on account of the intolerable pain; or he rocks himself backward and forward in the chair, crying out or uttering deep groans. In ten or twenty seconds, or perhaps a minute at the longest, the paroxysm is over! it ceases as abruptly as it began. The pain sometimes affects all the branches of the fifth nerve; sometimes only those of the second or of the third division. In certain cases the muscles of the affected side of the face are thrown into violent spasms during the fit of pain, so that the patient makes horrible grimaces and contortions. These are the cases which really deserve the title of *tic douloureux*. Flushing of the face, redness of the eyes, and lacrymation, usually following pallor, are frequently present, and show that vaso-motor and secretory fibres accompany the fifth nerve. The paroxysm may return every few minutes; Trousseau mentions one patient who had sometimes twenty in an hour, and that in the worst cases they do not intermit, even during the night. They are often brought on by movements of the jaws as in speaking, or in eating or drinking; and sometimes pressure upon one of the teeth will instantly excite an attack. At first the paroxysms cease during sleep; later their continuance renders sleep impossible. Sometimes remission occurs, the patient remaining free from the disease for several days together, or even for months. But sooner or later it returns, and is as severe as ever.

The "tender points" are usually well marked; they are situated at some or all of the numerous spots at which branches of the trigeminal nerve emerge from bony channels, or perforate fasciae. Pressure upon any of them is instantaneously followed by agonizing pain, and a breath of cold air upon the face may have a similar effect.

When the disease is of long standing, the hair disappears from the affected side of the face, being worn off by friction. Zona not infrequently follows or is followed by neuralgia, particularly when it affects the supraorbital nerve. The hair of the scalp in supra-orbital neuralgia, and of the beard in infra-orbital is sometimes turned white on the affected side.

The disease scarcely ever occurs under forty, and often begins at a much later age. The disease usually begins between forty and sixty. It is not more common in one sex than in the other.

Sufferers from severe facial neuralgia are often the subjects of suicidal melancholy, and their mental condition is almost always one of depression. This is no doubt due to the severe pain which they endure, but, also, they are sorely tempted to seek a temporary relief in drink, which brings its penalty in increased despondency afterwards.

The aetiology of this severe form of facial neuralgia has not been quite worked out. It is not hereditary, occurs in both sexes, and is not connected with insanity or hysteria. It is generally

accepted that it is due to an ascending peripheral neuritis, and when we consider the anatomical distribution of the nerve, and the prevalence of nasal, antral, and dental disease, we can readily recognize the tendency of prolonged irritation, whether infective or otherwise, to set up an ascending peripheral neuritis of the terminal filaments of the fifth nerve, which may eventually extend as far as the Gasserian ganglion. Furthermore, the antra of highmore, together with the other nasal accessory sinuses, according to Ballanger, are the residual remains of the olfactory organ as found in some of the lower animals whose sense of smell is very acute. In the mysterious process of evolution, the large distribution of the olfactory nerve has become less and less necessary, hence the sinuses are being gradually closed off from the nasal chambers until only small openings are present in man, and inflammation of the lining mucus membrane of the walled-off space is very apt to occur, and so become an important pathological process in view of the tendency to destructiveness owing to lack of normal ventilation and drainage, and is especially interesting in view of the antra of Highmore being supplied with filaments of the fifth nerve. Moreover, a number of cases have been definitely reported, in which localized inflammation and ulceration of the mucous membrane of the nose has been the apparent origin of trifacial neuralgia. The nasal branches, supplying the mucous membrane on the turbinated bones, were first affected, later that on the septum, finally creeping upward and so reaching Meckel's ganglion, and eventually the main trunk of the infra-orbital. Local treatment of the nose has in several cases relieved the pain for a time.

Among other causes enumerated by Sir Victor Horsley, are the following:—

1. Cold.
2. Worry.
3. Alcohol.
4. Traumatism, including local injury to the nerve trunks as they pass through the bones; local injury to their peripheral branches; fractures of the skull in which the fracture runs through one or the other foramen.
5. Osteitis of the alveolar borders of the jaws due to dental caries.

Sir Victor has several times seen dental caries leading to chronic osteitis, in the tooth socket produce typical trigeminal neuralgia, confined at first to the anterior dental nerve (in all the cases in which this mode of origin was clearly established, it happened to be the upper jaw); and after the anterior dental had for some time been the seat of pain, it next invaded the main trunk of the infra-orbital, i.e., including the cutaneous distribution of the same. Under these circumstances we have an ascending neuritis of perhaps simple septic origin.

The pathological changes which have been observed have not

been very constant. Horsley found no changes in the nerve fibres themselves, but the eipneurium in every instance was shrunk and sclerosed. On the other hand, Krause observed that the Gasserian ganglion cells were some of them markedly shrunk, and in others the nucleus was not visible, while among normal cells completely degenerated ones were to be found.

Practically no changes have been found in the central roots of the ganglion and in the nervous system, and should the absence of these changes be confirmed, it would speak strongly for the view held by Sir Victor Horsley, which is practically confirmed by the surgical history of the disease, namely, that a case of tic douloureux is one of an ascending peripheral neuritis, and that the Gasserian ganglion affords a bar to the further progress of the disease. Another interesting condition which has been observed, is a definite increase of intra-cranial tension.

There is a less intense neuralgia, neuralgia facialis minor, which often occurs in young persons, and may depend on disease of the teeth. The pain shoots and darts along the branches of the fifth nerve, but it is generally accompanied with a dull aching or gnawing sensation. It is often paroxysmal, and (like other forms of neuralgia), it is apt to come on when the patient is fatigued or exhausted from want of food. It is seldom severe enough to prevent him from attending to the duties or pleasures of life, although it may cause him great discomfort. In many cases it is relieved at once by a glass of wine or a dose of quinine. The most frequent cause of this form of neuralgia is chronic inflammation of a tooth-pulp. Other conditions are the difficult eruption of a wisdom-tooth (or its impaction in its socket), the presence of secondary dentine in a pulp cavity, exostosis, hypertrophy of the crista petrosa, alveolar periostitis, decomposition of a dead pulp in a confined space, and even the exposure of sensitive dentine, or the crowding of the teeth together from insufficiency of room. In many instances the affected tooth is tender, so that sudden pressure on it, or the contact of substances much hotter or colder than itself, starts an attack of pain. Other seats of "dental neuralgia" may be the supra-orbital nerve, the globe of the eye, the temple, and particularly a spot a little to one side of the vertex. The practical rules would seem to be that the only way of avoiding the risk of overlooking affections of the teeth as causes of the milder forms of trigeminal neuralgia is to have the jaws thoroughly examined by the dentist in every case. There are some curious instances recorded in which the nutrition of parts affected with reflex neuralgia, from caries of the teeth underwent perversion; in one, the iris of the affected eye, from being of a deep hazel color, became of a dull grey.

The less severe forms of facial neuralgia, as well as other local varieties, are more often seen in women than in men; they are most common between puberty and marriage, or at the climacteric period.

They often accompany anemia of the slighter kinds, hysteria, and malaria. The so-called neuralgia of gout, diabetes, and alcohol is probably due to peripheral neuritis.

From the foregoing, it will be inferred that the minor neuralgias occur in the early part of life, while neuralgia major or *tic douloureux* is found chiefly in the later periods of life, and perhaps the discrepancy in age, considered apart from the more or less inevitable sclerosis of the arterial system which may have developed, and which may be a contributing cause, may be explained by attributing *tic douloureux* as having its origin in long continued irritation, whether dental, nasal or otherwise, which process may for many years remain more or less quiescent, but which may eventually lead to the development of an ascending neuritis and therefore to *tic douloureux*. I do not know whether this theory has been emphasized to any extent, but it would seem to be as plausible as many which are suggested as explaining the condition as distinguished from neuralgia minor, as it does not seem reasonable to erect an arbitrary barrier between the two processes.

I shall only refer to two more features of an interesting nature in connection with *tic douloureux*. One is the fact that it is far more common on the right side, and the other is a remarkable phase described by Trousseau. It is exhibited by patients, who, though saying that they are not necessarily attacked by an onset of pain at the time, nevertheless suddenly fall as though they lost consciousness, but they recover themselves almost directly, and assert that they do not lose their senses. Dr. John Bell, an English surgeon, demonstrated this quite clearly, and the following is his own description of his somewhat unique experiment:—

“I seated my patient in a chair, and without any anaesthesia, pressed the point of my forefinger deep into the hollow where the nerve lies, cut it across by striking in a small sharp-pointed knife, making no length of outward incision, and hooking the point of the crooked bistoury behind the nerve. In the very instant of the stroke by which it was divided, Capt. G—— started from his seat, ran forward in great confusion, exclaiming, “Good God, what’s that?” He sat down instantly, in perfect composure, free from pain, unconscious of the operation being performed, and expecting it. When questioned about the sensation which made him start up, he said he felt nothing but as if he had been shot in the head, followed by a momentary confusion and a total relief from pain. He said he did not imagine the operation done, because the first operation had been a deliberate dissection. He felt now perfectly confident that he was cured, and returned home in two days, since which time he has lived in perfect health, is happily married, and continues well at this moment.”

The treatment, other than that of prophylaxis, may be divided into medical, surgical, and local injections.

Medical treatment consists in fresh air, regular exercise, plenty of sleep, and an abundant supply of food, for it has been said that neuralgia is the cry of a nerve for food. Among the drugs used are quinine, ammonium chloride, iron, arsenic, butyl-chlor-aldehyde hydrate, antipyrin, phenacetin, espirin, bromides and gelsemium.

Local treatment consists in the application of rubefacients over the painful points, such as belladonna, chloral hydrate with camphor, chlorform liniment or menthol, the ointment of aconitine; and in the symptomatic neuralgia of the second division of the fifth nerve from the teeth, tincture of aconite applied locally has a most welcome benumbing effect on the pain. Morphine is used as a dernier resort.

The surgical treatment may be classified into minor and major operations. The minor ones include:

(a) Nerve stretching, which has been discarded, as the relief afforded is only of a very temporary duration, from a few weeks to a few months.

(b) Simple neurotomy, as originally practised, is now practically abandoned, since re-union of the divided portion is so rapid and complete that the relief is only temporary.

(c) Neurectomy, which consists in the exposure of the affected nerve for as long a distance as possible, and the cutting out of the longest possible section.

(d) Thiersch's method first divides the nerve, and then each end in turn is seized by small forceps obliquely to its long axis and twisted. The nerve becomes wound about the forceps, and twisted and pulled out even to the finer divisions of its peripheral branches, and centrally to its foramen of exit.

The major operations are:

1. Carnochan's method exposes and divides the superior maxillary nerve at the foramen rotundum, while Kocher's method does the same, in so far as the inferior maxillary at the foramen ovale is concerned.

2. Kronlein's temporal method resects the second and third divisions together at the base of the skull.

3. The Hartley-Krause operation is a formidable one, and consists in opening the skull in the temporal region, lifting out of the way the temporo-sphenoidal lobe, and removing the Gasserian ganglion, with the sensory root of the fifth nerve.

4. Finally, Abbe's method consists in the subdural interposition of rubber tissue, without removal of the Gasserian ganglion in operation for tic douloureux.

In so far as the injection of alcohol is concerned, a solution containing—Cocaine, gr. I; Chlorform, m. X; Alcohol 80 per cent., oz. $\frac{1}{2}$.

The injection of the superficial branches as they make their exit on the face, is a procedure of little difficulty, requiring but little knowledge, since the foramina are all

palpable on the face, and are not over $\frac{1}{2}$ -inch distant from the surface. But it has been found that the injection of the superficial branches is not always effectual, and it is the extension of this treatment to the injection of the branches, as they make their exit from the foramen ovale rotundum and sphenoidal fissure that presents a problem, involving primarily anatomic accuracy. However, by following certain guides, it has been found possible to secure successful deep injection of the ophthalmic, the superior and inferior maxillary divisions as they make their exit from the sphenoidal fissure, the foramina rotundum and ovale respectively. The injection is seldom made directly into the nerve, but rather in the vicinity of the nerve, and the diffusion of the agent accomplishes the desired purpose. The process is not entirely free from danger, and I believe a case of atrophy of the optic nerve has been reported, following upon deep injection of alcohol. A curious fact about the alcohol injection is that it does not destroy the nerve, but in some way changes its chemistry. In other words, the pain is relieved, but sensation is not destroyed. Osmic has also been used as an injection.

In conclusion, I would again emphasize the prophylactic treatment to you, and when a night bell makes you descend from the comfort and enjoyment of your living apartments, in response to the call of a poor sufferer from neuralgia, in so far as the dental symptoms of it are concerned, and in extending your skill and sympathy to such a case, I would have you think of a little passage in "Romeo and Juliet":

"One fire burns out another's burning,
One pain is lessen'd by another's anguish."

And that dentistry and medicine, in such cases, are working hand in hand towards the amelioration of that suffering humanity, so well described in "The Goblet of Life":

"O suffering, sad humanity,
O ye afflicted ones, who lie
Steeped to the lips in misery,
Longing, and yet afraid to die,
Patient, though sorely tried."

ACCIDENTS TO THE TEETH WHICH DO NOT INVOLVE THE ALVEOLAR PROCESS.

E. F. ARNOLD, D.D.S., L.D.S.

Read before the Toronto Dental Society, February 28th, 1911.

The subject of my paper this evening is "Accidents to the Teeth which do not Involve the Alveolar Process."

Now, if there is one part of our practise more than another which requires the most careful consideration, and which causes us an infinite amount of worry, it is that part of our work which might properly come under the head of accidents. Fractures of the maxilla, fractures of the alveolus, and fractures of the tooth itself. Accidents to fillings; (think of them alone), sometimes knocked out, or broken by biting something hard, but mostly the patient says: "I was eating a piece of soft bread and it just fell out." Then there are broken bridges, broken dentures, and broken crowns, punctured roots, and split roots, breaking off broaches and drills in root canals, etc., etc. I might go on and on with no end practically of accidents; therefore, you see how most of our troubles are traceable to accidents.

Now, I am not going to take up a method of treatment for all that might come under this list. For if I were to try to deal with all of those undesirable happenings or harmful events or unfortunate injuries which occur to the teeth alone, and which are not the result of personal negligence or misconduct, I would take up far too much time to-night; therefore, I am going to deal with only a few accidents that I have treated and had fair success with myself.

The first I shall mention is the simplest, but nevertheless of very great importance, in that it is most frequently met with, and through which so many teeth are *badly disfigured* and some even eventually lost. I speak of those small fractures to the enamel of the teeth caused by biting a thread sometimes or in any other way, where a small portion of the incisal edge of the tooth is broken away. They may seem of little importance, but I think they are very important. What are we going to do with them? I have seen a great many cut into and a small gold filling inserted probably in otherwise a perfect row of teeth. I have seen porcelain used. It is better, not quite so much of a disfigurement. Now I think that in nearly every case where the fracture is not too large, that the tooth should be ground slightly on either side of the fracture, and the imperfection so polished down that it may be completely removed or made practically unnoticeable, and with less harm to the tooth than by using any filling material that we have to-day. Even where the fracture is larger, we should stop to think before cutting away good tooth tissue in order to replace it with some filling material. Better in the majority of cases, I

think, where there is no decay, and there very seldom is, to smooth off the edges and leave even a slight imperfection, in the tooth, than to try to replace it and make a greater imperfection. Where the fracture is too large for this treatment, then a porcelain inlay may be used.

Now, we will simply take a step farther to larger fractures, corners completely gone. You have all had them to deal with. They are very perplexing under certain conditions, depending upon the patient and the condition of the teeth. When you wish to be particular, where the teeth are practically perfect, the first thought that comes to mind is a porcelain corner. It should be a perfect fit and a perfect match in shade, which, I think, in these cases is our *ideal*, formed from our knowledge of the art of replacing lost tooth tissue so far as known to us to-day. Some day we may have something even better than a perfectly made porcelain inlay. But the trouble arises, namely, to get a perfect inlay. We all know that is impossible. Many of us might make something that would do, that we could make the patient believe was fine, but we know in our own minds how far from perfection it is. Therefore, after we have tried and failed, we are very much inclined to look for an easier material to manipulate, and lose sight of the ideal and what we would like to see done if we could only do it, and what is the result? We use a gold inlay and disfigure the patient's teeth, otherwise in good condition and let our ideal fly to the winds, while some have even gone so far as to sell their porcelain furnace. A porcelain corner should be our ideal, and we must not lose sight of it. The technique of it you all know as well or better than I; therefore I will not discuss it.

Now, when a larger portion of the tooth is lost, the fracture extending to half or more of the crown of the tooth, as I had in one case, the patient presenting himself the morning after the night before with what had been a pair of perfectly good centrals, broken off, the fracture running from about a third of the way up from the incisal edge through the pulp chamber (leaving the pulp protruding) to a point almost at the gum line on the lingual. I think in a case of this kind the pulp could be removed and the broken pieces attached as you would a porcelain tip, with two small platinum pins, if you had the pieces which were broken off, but in the case I speak of I do not think he would have remembered, or even ever knew, what became of the pieces that were broken off. Therefore, I simply put on two porcelain crowns.

A fracture commonly met with is a fracture to bicuspid where either the buccal or lingual cusp is split off, the fracture extending up to or under the gum, generally the latter. The patient presents himself or herself with a portion of the tooth held in place merely by a small attachment to the gum. Now, if the injury does not extend below the gum line, a porcelain crown may be used. If it does extend below the gum, then I say leave the piece of tooth on.

Always remove the pulp if it has not been removed, because the shock to the nerve may have caused its death or may, if not already dead, die from the shock in the future; therefore remove it at once and cement the fractured tooth together. After this it can be ground down and an ordinary shell crown used to bind and hold the broken piece in place and restore the tooth to good condition and give the patient good service for some time to come.

An accident which frequently happens is when a root is split from a blow or hard bite on a dowel or pin crown. I can best deal with this, I think, by citing a case I treated some two years ago. A lady of middle age, all her upper and some of her lower anterior teeth were crowns, and, by the way, presenting the greatest variety of crowns I have ever seen in any one mouth. Souvenirs from about a dozen different dentists in the city, and she knew them all off by heart, just who put on each crown. I can assure you they were quite an interesting study. Well, the left central was off, and the root split almost in the centre, so I was anxious to save this root and add, or rather replace, one of the souvenirs. The root had been ground off below the gum line, so a band was out of the question, as it would irritate the peridental membrane, and subsequently cause the loss of the tooth were it made wide enough to be of sufficient strength. Therefore, I cut a groove around the end of the root as near the outer edge as I possibly could. This groove was made with a very fine fissure bur about $\frac{1}{16}$ of an inch in depth and as narrow as possible. Into this groove I fitted a platinum band, and holding the fractured root together, cemented it in place. After the cement had set the crown was put on, and it is still doing service along with the others.

The last accident I will speak of is where from a blow or other cause a pulp dies in a tooth, causing a discoloration. Now, we all have these to deal with, and they worry us some, too. I worried over two or three once, trying to bleach them, but with practically no success, except that they were just as dark and discolored after I tried as they were before, but if any others have had success I would be glad to hear from them, and only too willing to try again. Now, when I find a tooth discolored, I clean it out thoroughly, extending the pulp chamber well, and fill the pulp chamber with a good white cement. If this does not give the result desired, I cut it off and put on one that does not require to be bleached. Now, gentlemen, I realize that I have come far short of covering all accidents to the teeth themselves, but, as I told the Secretary when he asked me to give a paper on this subject, that I would give only those I had come in contact with in my own practise, and my own way of treating them, therefore I trust that the discussion may bring out something that will benefit us all, and if so, my paper will not have been in vain.

Thanking you, gentlemen, for your kind attention.

ACCIDENTS TO THE ALVEOLAR PROCESS AND DIS- LOCATED TEETH.

C. E. PEARSON, D.D.S., L.D.S., TORONTO, CAN.

Read before the Toronto Dental Society, February 28th, 1911.

Accidents to the first dentition often result in the loss of one or more teeth, considerably disfiguring to the child, and as a rule the dentist hears about such things long afterwards, but when taken in time there is no reason why a child of three or four years should have to spend several years without an anterior tooth. A little care and perhaps difficulty on the part of the dentist would save the tooth until naturally lost.

Accidents to the second dentition, however, are of a much more serious nature, frequently resulting in life-long disfigurement. Particularly is this so when the injury is severe and occurs to the anterior teeth before the roots are completely formed.

For instance, I know of one case where the central was lost probably twenty years ago. No replacement was made, but the lateral and remaining central were drawn together, closing the space. At thirty when the moustache is not the prevailing style I leave you to judge of the treatment.

The history of the teeth which have been dislocated during youth varies considerably. Sometimes recovery is complete without even the death of the pulp. Again, while the pulp remains alive the tooth elongates and never becomes firm and solid, with development of pyorrhea and early loss.

So far as I am able to judge from my own experience, a slight dislocation before the age of ten years is not likely to result seriously; in fact I am inclined to the opinion that where there is no fracture of the tooth the dislocation may be quite severe without resulting in the loss of the pulp. It may be that the direction of the dislocation has some influence on results. For instance, a labial or lingual dislocation may not have as serious results as one where the tooth is driven into the socket. Later in life, however, death of the pulp usually follows even a slight injury. Only last November I had a case in which the upper left central incisor became so inflamed from suddenly biting onto a small stone in a currant bun that the pulp had to be removed.

Simple dislocations are best treated by forcibly bringing the injured tooth or teeth into normal position and mechanically holding them in position by ligatures, bands or splints until the injured soft tissue and the process have recovered. Where only one or two teeth are involved ligating with well-waxed D silk twist to the adjacent teeth, then covering them with a gutta percha splint, is all that is necessary. Bands extending to solid teeth and soldered together, making rigid the involved teeth, is probably neater and

more comfortable, and is the most secure method which may be used.

The consideration of a few cases will best illustrate the treatment. In the summer of 1909 a young man, age 22, riding a bicycle, was caught between two street cars, and among other injuries was minus the upper right lateral. It had been knocked upwards and outwards, carrying a V-shaped piece of process with it. The tooth was not found, but the process projecting outwards was held by the gum tissue on one side. This was pressed into place with the finger and the socket packed with cotton until a suitable tooth for transplantation was found. The second day after the accident a tooth was found, ligated into position with silk and sheet gutta percha lapped from the palatine surfaces of the cuspid, lateral and central, over the incisal edges, and stuck fast to the labial surfaces. This was worn for about five weeks, and the patient has not been heard from since.

CHAS. E.—A baseball player had his two upper centrals and right lateral figuratively speaking knocked down his throat. The process was badly jammed and crushed tissues much swollen. The teeth were intact and, after the usual treatment and canal filling, were gradually worked into their respective sockets, thus forcing the crushed process again into place. An instrument about the shape of the roots was used to help lift the broken process. The teeth were ligated and again gutta percha seemed the most suitable substance for the splint, it being moulded about the teeth and those adjacent until a strong body was built up. After three weeks it was removed and gold bands from cuspid to cuspid were soldered together and cemented to place. This was worn for six months. There was some recession of the gums and one central was slightly elongated, but otherwise a good recovery was made.

Mr. H. was struck in the mouth with a hay-fork, dislocating the upper right central. Nothing was done for a week, when the pain of the putrescent pulp forced him to leave his work for attention.

The canal was opened and a dressing sealed in and he returned home. In about a month the pain returned, and in desperation at midnight he visited the village blacksmith.

For ten days he stood the pleasantries of his friends and then again sought assistance. The tooth was at home in the woodshed, but it was sent for. It was much colored, but bleached out with 3% pyrozone in the course of a few days. The socket was enlarged with pressure from a gutta percha plug ligated to place and enlarged daily for several days. The tooth was treated and filled and replaced and held with a splint until firm. This was seven years ago. To-day I heard the tooth was lost recently from carelessness and eating corn on the cob.

ACCIDENTS TO THE MAXILLA AND MANDIBLE NOT INCLUDING FRACTURES OF THE ALVEOLUS.

A. E. WEBSTER, D.D.S., L.D.S., M.D., TORONTO, CAN.

Read before the Toronto Dental Society, February, 1911.

In a ten-minute paper only essentials can be touched. Though the dentist can treat fractures of the jaw with excellent results and with little discomfort to the patient, comparatively few cases come under his observation. People who sustain fractures of the jaws are more likely to drift into the general clinic of a large hospital. A dentist is seldom called unless the surgeon in charge knows the dentist can do better than he can and is not jealous of his own reputation. The cases which commonly apply to the dentist are those in which the patient has a loosened tooth and pain as the result of an accident. A dentist may be called to see complicated cases, showing much displacement, or to see cases as the result of poor replacement or poor fixation. In some localities dentists set and treat all the fractures of the jaw which occur. The surgeons have learned that fractures of the jaw are troublesome to treat and that the dentist gets good results with less distress to the patient than they do.

Fractures of the mandible are of common occurrence and are generally the result of blows upon the face from fist, kick from large animals, the impact of some heavy missile, gunshot injuries, fall from a bicycle, a horse, or a building, injuries from wheel passing over face, railway or street car accidents.

SYMPTOMS.—The symptoms are generally well marked, except in cases where there is little displacement. There is always the history of an accident, crepitus, deformity, unnatural mobility, pain, loose teeth, hemorrhage, malocclusion, and if long standing, fetid odor, and if complicated, pus formation.

DIAGNOSIS is usually simple except where there is no displacement. If in doubt place the patient in a low chair, taking a position behind him; then grasp the jaws with both hands, the thumbs upon the ends of the teeth and the fingers beneath the chin, and test, alternately depressing and elevating first one side and then the other. Crepitation can thus be made out.

PROGNOSIS.—Good, uncomplicated cases recover in four to six weeks. I have seen simple cases firm in less than three weeks. If infection occurs they may be months in healing. The calus may sometimes cause much deformity.

TREATMENT.—Accurate adjustment of the parts, fixation and cleanliness are the essentials.

The method of fixation depends largely upon the conditions presenting. Fractures complicated with lacerated wounds and hemorrhage should have these complications attended to before fixation is attempted. Compound fractures are often later compli-

cated with infections which are distressing and cause delayed union. If there is laceration of tissue inside of the mouth or a compound fracture it is unwise to choose a method of fixation which will hinder proper dressing of the wounds. If there are many teeth present there is no need of fastening the lower jaw to the upper or bandaging the lower against the upper.

There are many methods of fixation, from the simple four-tailed bandage to the most complicated interdental splint. Fortunately fractures of the jaw tend to heal rapidly.



Fig. 1

Four-tailed Bandage for Fracture of the Lower Jaw

BANDAGING the lower jaw against the upper is the simplest and most uncertain method of fixation. The bandage stretches or shifts and allows the jaws to separate. The mouth fills with saliva and food particles and becomes exceedingly foul. The very room in which the patient is confined is filled with an oppressive filthy odor. The bandage is the only resort of the average surgeon. Even to-day in our best hospitals the four-tailed bandage is used, with the usual deformities resulting. The method of application is simple. Select a piece of bandage material long enough to comfortably tie on top of the head when passed under the chin, and about four inches or more in width. Tear it down from each end to within four inches of the centre and cut a little opening for the chin to protrude. Place under the chin and tie tightly over the head. Such a bandage keeps the chin back and the lower teeth tight against the upper. The Barton or Hamilton bandage is occasionally used. Bandaging is usually a temporary expedient until a better method of fixation is devised. Heavy felt board or card board is sometimes molded to fit the chin and lower jaw and the bandage applied over this. Bandaging means closure of the mouth and feeding through an

opening made by extracting teeth. Two exceedingly objectionable conditions.

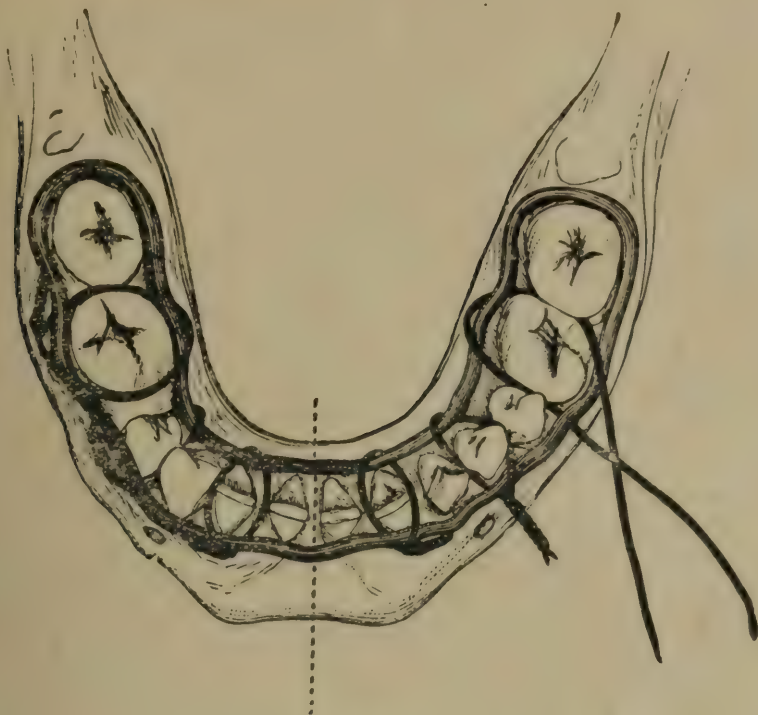


Fig. 2

Hammond Wire Splint

WIRE SPLINTS.—A simple and effective wire splint may be made for fractures occurring among the teeth by annealing 16-gauge German silver wire and adapting it to the teeth, one wire on the buccal and one on the lingual; orthodontia brass wire may be laced around the wire and through the inter-proximal spaces. If the wires cannot be adapted in the mouth an impression and model may be made, upon which it can be adapted. I have used such a splint in two cases, but found the wires very difficult to adjust to the teeth of a patient in bed two days after the accident. No matter what method is employed there are many difficulties.

WIRE SUTURES.—In simple fractures of the lower jaw where there are no teeth, or occasionally in cases of ununited fractures, suturing through the bone may be done to advantage. There is little if any difficulty in the operation. The author has operated in this manner twice upon the lower jaw and once upon the upper. The operation should be made through the mouth. The holes to receive the wire should be well back from the fracture and between the roots of teeth if any are present. If there is any difficulty of adaptation two holes may be made in each fragment and the two wires crossed. Lead plates two to three M.M. thick may be adapted to each side and holes cut in them opposite to those in the bone and the wires brought through and well set up. There is no need for incisions or dissecting tissue, as some authors describe. A coarsely bladed bur 1 M.M. in diameter will pierce the bone

rapidly. Silver wire, or, better, copper wire cased with silver, about gauge 20, is passed through the holes, bringing the ends out on the buccal. The fragments are adjusted and the wires set up tightly and the ends turned in so as not to irritate. In ununited cases it is common practice nowadays to dissect the tissues from the bone and adjust a metal plate to the bone and insert a couple of screw nails into the bone at each side of the fracture.

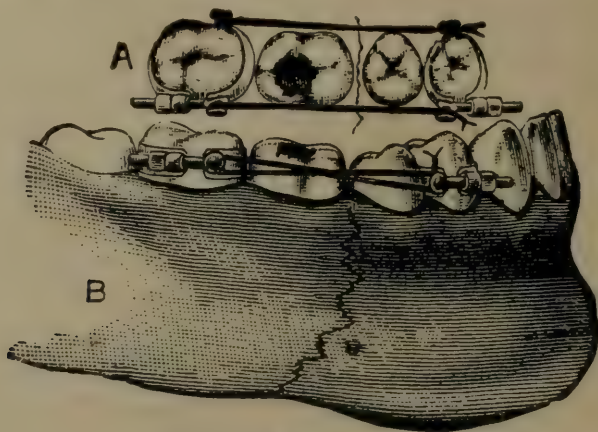


Fig. 3
Anfile Apparatus, Showing Adjustment

BANDING THE TEETH.—This is without doubt the simplest and most secure and most sanitary method of fixation of a fracture of the jaws when there are firm teeth in each fragment. There are regular fracture bands for this purpose. They are as easily adapted and adjusted as orthodontia bands. A firm tooth on each side of the fracture is selected and a band adjusted to it. Brass wires are wound round the spurs from one band to the other on both the buccal and the lingual, the fracture is adjusted and the wires well set up.

The author in one case of ununited fracture used ordinary orthodontia bands, passing a heavy threaded wire through the tubes with a nut at each end, the ends of the tubes came in contact, and when the nuts were set up there was no movement of the fragments. Pus which had formed at the point of fracture was evacuated beneath the chin and the cavity dressed and kept clean until union occurred.

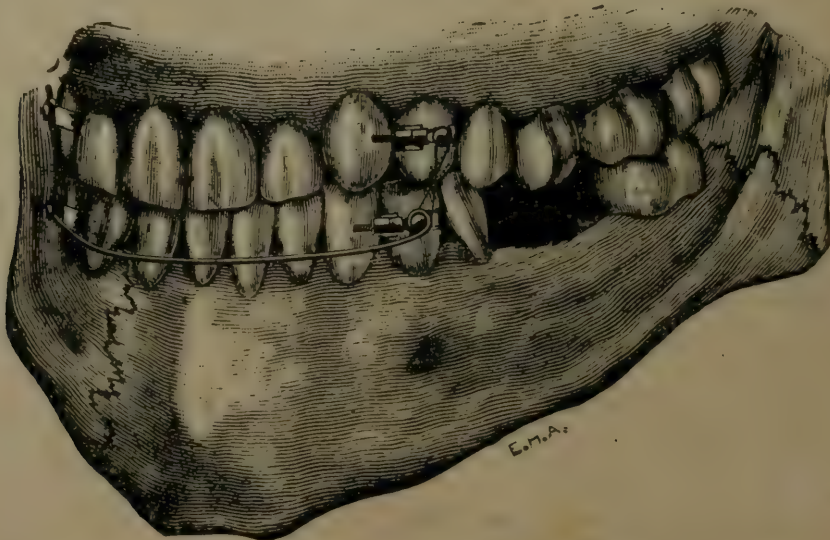


Fig. 4—Angle Appliance for Fracture through the Angle and Cuspid Region

Fractures which occur posterior to the teeth may be best treated by adjusting fracture bands to the upper and lower teeth and wiring the upper to the lower. Feeding can be done posterior to the teeth.

The methods described are satisfactory in the great majority of cases, but occasionally an interdental splint is desirable. The advantages of fracture bands and open wire splints is the setting of the parts at rest without resorting to the discomfort and pain of an impression. It is all right to describe how to take an impression, but it is another thing to do it. The parts are swollen, the teeth are loose and sore, there is usually blood and much saliva. Add to this a patient in bed, with other injuries, a poor light and poor facilities, and you have difficulties worthy of anyone's skill.

Select a cup with plenty of room. If the impression is to be taken in a private house or at most hospitals use compound, otherwise use plaster. The jaw should be well supported from below by the two hands of an assistant while the impression material is being pressed against the teeth. An accurate impression of the upper should be taken first. When the models are made the lower model should be fractured at the point of fracture in the jaw and then adjusted to the articulation of the upper teeth and secured in position, set in an articulator and wax covered over the lower teeth to their full depth and about 2 M.M. thick, building the wax so it articulates fairly well with the upper. The lower is now flaked, packed, vulcanized and finished. It may be necessary to cut away interseptal rubber from between the teeth markings, or in some cases enlarge the markings. This latter is best done by brushing a thin solution of plaster over the teeth of the model before waxing up or by covering the teeth with a fairly heavy tin foil. Holes should be bored from the buccal to strike the points of the cusps, so that when setting it may be known if the teeth go right to place.

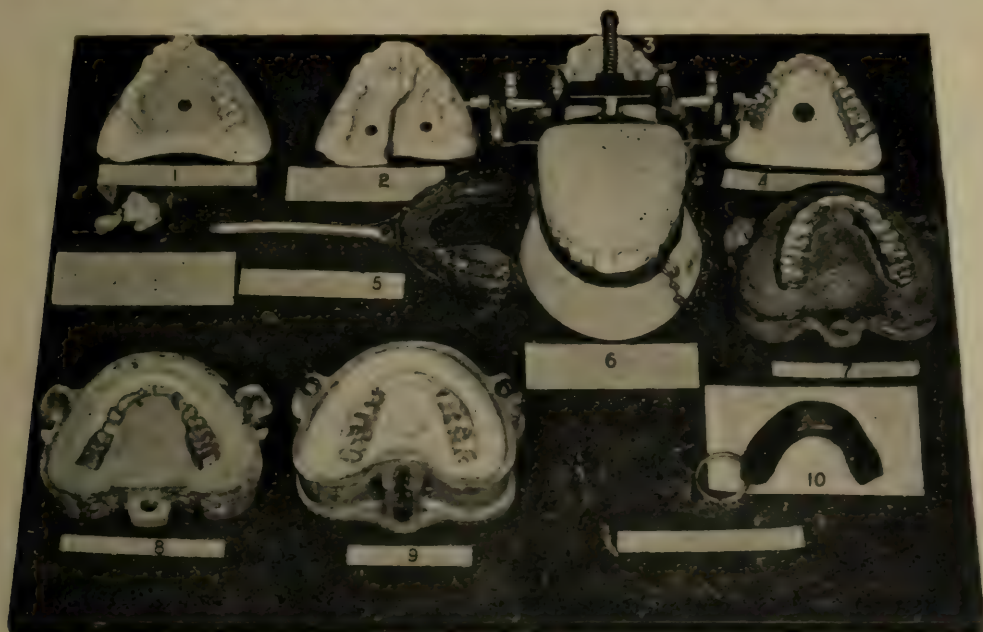


Fig. 5—Steps in making an Interdental Splint

STEPS SHOWN IN CASE.

To set such a splint is not the simplest matter in the operation. The teeth must be as well cleaned as possible and made as dry as can be. The splint fitted at least once before cementing. The cement must be thin, quick setting, hydraulic. The splint having been made to articulate with the uppers, the fragments of the lower jaw may be forcibly moulded into the splint and held there until the cement hardens. With such a splint articulating with the uppers the patient will soon learn to chew and may go about his ordinary occupation in life.



Fig. 6—Kingsley's Interdental Splint

KINGSLEY SPLINT.

There is the Kingsley splint, made the same way as the above except that it is not cemented in place, but instead two heavy bars are vulcanized into the buccal sides and bent backwards after coming out of each corner of the mouth, reaching almost to the ears. A socket vulcanized into the buccal surfaces as case in Fig. V. will serve the same purpose. When the splint is put in place broad bandages pass under the chin from one bar to the other; in this way the splint on the teeth presses downwards and the bandage upwards on the bones below.



Fig. 7—Kingsley's Interdental Splint Applied

FRACTURES OF THE MAXILLA.

Fractures of the maxilla are less frequent than fractures of the mandible. The author has treated but three cases—one from the kick of a horse, one complicated with a fracture of the mandible in a railroad accident, and the other caused by a bump from the head of an opponent in a basketball game.

The latter case was referred to me by Dr. Thornton. The blow was sufficient to force all the teeth and right maxilla almost to the median line. He forced the teeth back almost to alignment with his thumb. There was little hemorrhage at the time. In a few days much pain and swelling occurred. For three weeks he was confined to his bed with a temperature from 100 to 102. Several sinuses opened both on the buccal and lingual. The teeth on the affected side elongated until the teeth on the opposite side did not close within the thickness of a lead pencil. At first it seemed as if the teeth and much of the jaw would be lost. The physical condition of the patient was poor.

TREATMENT.—The incisors on the sound side and the second molar on the affected side were banded and a heavy bar run from one to the others in the proper position to bring the teeth into alignment with the lowers. When the teeth were securely ligated to the bar the patient was given a general anesthetic and three deep incisions were made on the buccal and bone burs forced in among the roots of the teeth. No attempt was made to remove the affected bone at this time. These cavities were washed out and packed from time to time with boracic gauze. Drainage only was sought. As soon as the teeth were in proper occlusion with the lowers the mandible was gradually forced up against the uppers, which finally put them to place. As new bone was formed pieces of loosened bone were removed. Parts were kept clean and the process of healing not interfered with. All the teeth were preserved and no deformity remains.

DISCUSSION.

DR. J. B. WILLMOTT.—Dr. Willmott said he had not met with as many cases of fracture of the jaw as some other practitioners. However, he had met with two or three rather unique cases. The first one was a man who applied to him to have a lower third molar extracted which was loose, and as soon as he applied the forceps and gave a little force it seemed as if he had almost turned the inside of his mouth outward. Upon a little more careful examination he found a fracture between the second and third molars, which was later found to be a result from a blow from a fist. He consulted with a surgeon, and they two adjusted a splint, which was supported by the teeth, with a happy result.

Case number two.—A woman who sustained an injury of the

superior maxilla by the bottom of an elevator striking her just beneath the nose as she was looking up the elevator shaft. The force was sufficient to dislodge the superior maxillary bones from their attachment to the skull. There was a good deal of hemorrhage and much effusion of blood into the loose cellular tissue of the face. Dr. Willmott was called to see her the second day after the accident. Both of the upper jaws were loose.

Treatment.—A horseshoe disk of tin was made. Upon one surface of this was placed hot compound and pressed against the lower teeth, removed, trimmed up and polished. Compound was then placed on the opposite side of the disk, and, after adjustment, pressed against the upper teeth, removed, and polished. The splint was now ready to be put in position, and was held there by bandaging the lower jaw tightly against the upper. The surgeon who had the case in charge removed the bandage in less than three weeks. At this time the bony union had not taken place at the point of the fracture, and when the patient closed her mouth a creaking sensation was felt, which gradually wore away when bony reunion took place. The patient was fed through an opening where the lower anterior teeth had previously been lost.

Case number three.—A young man was out riding, when he fell from his horse in taking a jump and the horse fell upon his head, dislodging the bones of the face from the skull and fracturing the lower jaw in two places. A splint was made in a similar manner as described in case two. But in attempting to get the broken bones of both jaws into relation, one of the lower fragments, where there was an oblique fracture, would slip out of position. This was finally fixed by suturing through the bone and the splint adjusted. After four or five weeks, when the splint was removed, the anterior teeth of the lower jaw did not come together by about a half an inch. This deformity was overcome by making a leather cap for the head and another for the chin, with supporting elastics between. In a very few weeks the teeth were brought into normal relation with each other, and to-day the patient shows no sign of having had such a severe accident. Dr. Willmott's opinion is that modelling compound makes just as good a splint as vulcanite and is much less trouble.

Dr. Amy said that he had frequently treated fractured roots of teeth, such as those occurring where a part of a root was split below the gum, by making a wax model and casting lead to reproduce the piece lost, because of the fracture, and then adjusting a crown. This is very suitable in bicuspid and molars.

Dr. C. H. Clarkson reported a case where the teeth some time after an accident gradually extruded and became sore, which was relieved when fixed by a splint.

Dr. Eaton treated a case where the lateral incisor root had been lost by making a porcelain root and attaching this to a central.

DR. A. J. McDONAGH.—A patient applied to Dr. McDonagh about fifteen years ago, having a split root of an upper first bicuspid which had become infected. He treated this for some time with poor results; he then removed the lingual root. The patient complained so bitterly for having lost part of her tooth, he decided to replace it, which he did, after cleaning up the root and washing out the socket. He put a pin in each fragment and bound the two pins together with wire. Recovery took place rapidly, and the patient had no further trouble with this tooth.

Dr. E. F. Arnold, in closing, said that he had good success with split roots by retaining both fragments and binding them close together with a band.

DR. A. E. WEBSTER reported a case of a central incisor, which had a split root, which had been bound together with gold band and a crown adjusted, and had been a continual source of pain, distress and infection until it was removed. Another case, which was the splitting of an upper first bicuspid with a vital pulp, and treated by banding and removal of the pulp with satisfactory results for the past eight years.

ELECTRICITY IN DENTISTRY.

By J. W. LEIGHTON,

Graduate of the University of Toronto in Electrical Engineering.

In the prosaic every-day world of work keen men are pitting their brains against those of other keen men. The creations that have received their best thought, care and attention are to be placed in competition with the product of other men equally ambitious.

In the manufacturing world one make of article is constantly being pitted against another. Each is carefully watched for its efficiency, reliability and economy. It is a contest which results in the survival of the fittest.

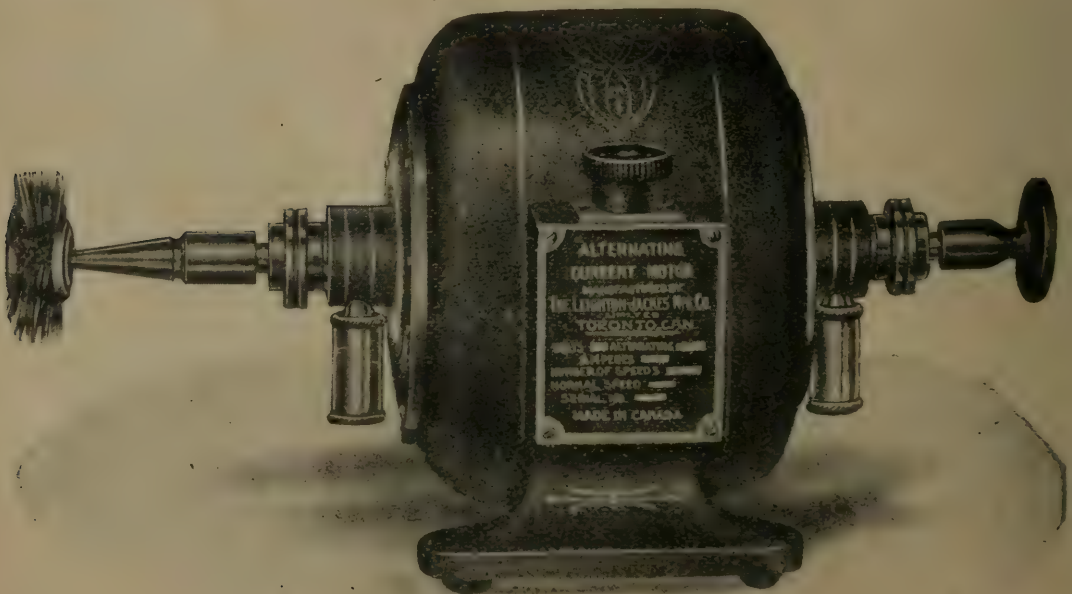
The line is not so sharply drawn in the professions, but the result nevertheless reaches a similar end.

Success is not attained so much by the genius and work of a single man as by the ability of that man to assimilate and use the methods and work of other men. There is nothing new in the world. The important thing in dentistry, as in other walks of life, is to recognize methods that will assist in the performance of the necessary operations. Leaders in the dental profession will all agree that the men who have worked out new methods and assisted the manufacturer to produce suitable appliances are responsible to a great degree for the advancement made in the last decade. Up-to-date appliances, then, are responsible for the marked difference in the standing of the dental profession; the best dentist in a com-

munity invariably has all the latest equipment. As one man put it, "I will purchase anything that will help me in my work."

In this article the electric laboratory lathe will be discussed, and to those who are pumping the old foot lathe, ask your brother practitioner how many times over has he saved the original cost in time and reputation. A plate can be polished in one-third the time required with a foot lathe, and the operator, experiencing no fatigue, will not slight the difficult partial plate, but will polish every portion as it should be. He can give his attention to producing perfect work, which in itself will bring more work. More work and more time in which to do it is the net result. The increased amount of work soon pays for the cost of the machine, and what is vastly more important, his reputation advances—success—more pleasure in life.

In the purchase of an article whether a lathe or gold filling, the buyer gets just what he pays for. Men have bought inferior lathes owing to their cheapness, but the crude and cheaper commercial grinders prove to be the more expensive in the end. One or two speeds are not sufficient to grind and buff properly. In purchasing a life-long article the best is none too good, and the cheap induction motor offered by some dealers cannot perform the operations required in dentistry for reasons to be discussed later in this article.



There are several points worthy of notice in the analytical construction of a lathe for efficiency, reliability and economy.

1. The shaft should be conveniently situated near the table so that the latter may be used to steady the arms of the operator while grinding. This also has the advantage of making the motor more rigid; the farther away the centre of rotation is from the table the

easier it is to tip the motor. For this reason, too, the legs should be spread as much as possible.

2. To obtain good results the stones should run true. This depends upon three conditions.

(a) The shaft and bearings should be of such a fit that there is no shake. Where there is play or shake in the spindle of a grinder it is impossible to get true or neat work.

(b) The chucks should be so designed that they will run true when placed in different positions on the shaft. This cannot be obtained by means of screwed chucks, they should be tapered fits, that is, the ends of the shaft should be tapered and the chucks reamed tapered.

(c) There should be a sufficient number of chucks so that when a stone is trued up it should never be removed from the chuck.

3. When a tapered fit is used in the holding of a chuck, some method must be employed to release it. There are 2 in general use.

(a) By means of a knurled nut which, when screwed forward, shoves the chuck off.

(b) By means of a lever hung below the bearing having a fork projecting upwards behind the chuck.

On an examination of both of these types, after being in operation several years, it will be found that the fork shows marked signs of wear, while the knurled nuts do not show any. This is due to the small contact surface offered by the fork; and in many instances the wear is so great that the lever will no longer release the chucks.

4. The life of a motor depends largely upon the wearing qualities of its frictional parts: wear means friction, and friction varies greatly and depends upon the following conditions:

(a) The metals that rub together.

(b) Method of lubrication.

(c) Absence of grit or other foreign matter.

The bearings, according to the latest scientific practice, should be composed of two different metals. The shaft or rotating part should be composed of a fine, close-grain tool steel, while the bearings should be composed of a metal slightly softer in quality, one having a dense, oily composition such as Tobin or phosphor bronze.

The bearings should be of liberal proportions and pressure should not exceed 75 pounds per square inch on the projected surface. According to standard practice, the length should equal at least five times the diameter.

It is essential to have the shaft absolutely round, and grinding is necessary to insure this.

The clearance between the bearing and shaft should be sufficient only to allow the shaft to float on a filament of oil. Bearings that have been properly made and of good materials will last a long time if given ordinary attention, but imperfect bearings, such as those of the cheap induction type, will soon wear and rattle.

There are two methods of lubrication in general use. One from an oil cup placed above the shaft, and the other from an oil cup placed below. Upon careful investigation it will be found that where oil is fed from the top of the shaft more oil is required owing to the fact that the oil feeds out more readily and works out at the end of the bearings. On the other hand, oil fed through a wick from below just supplies the correct amount. This is very important since most of the trouble is primarily bearing trouble.

SPEED CONTROL.

There are three methods used to obtain speed variation :

- (a) By having resistance in series with the armature.
- (b) By changing the strength of the magnetic fields.
- (c) By using a mechanical governor.

Of the first two methods method (a) gives the best results, for, by weakening the magnetic fields as in (b) a motor will race more or less and not develop power.

Method (c) has been in use for several years and, as far as constructive details are concerned, it has proven entirely satisfactory.

It is self-evident that a centrifugal governor will maintain the speed for which it is set up to the loading of the motor to its full capacity, and this is the condition which gives the best results.

The foregoing are a few of the essential details in motor design and the cheaper grades of dental lathes are sadly lacking in these respects.

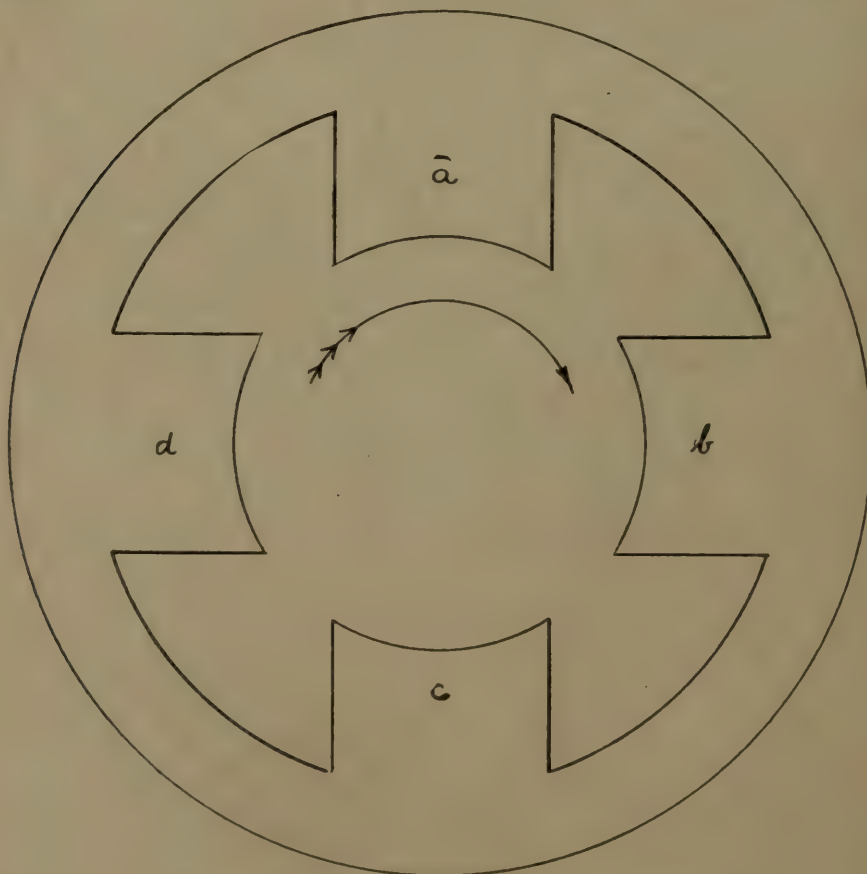


DIAGRAM OF INDUCTION MOTOR

Alternating current lathes are divided into two distinct classes. The series wound armature type, to which class the high grade dental lathe belongs, and the induction type, to which belongs the cheaper commercial polishing motor. The former is recognized by its quiet running and greater number of speeds; the latter is seldom quiet even when new, and has only two speeds at the most.

PRINCIPLE OF THE INDUCTION MOTOR.

It is difficult to explain fully in this limited amount of space all the features of an induction motor, suffice it is to say, however, that the distinguishing feature of an induction motor is the rotating magnetic field. In previous chapters the principal functions of alternating current were explained. The current during a cycle of action rapidly rises from zero to a maximum, falls to zero, reverses its direction, attains a maximum in the new direction, and again returns to zero. During the progress of a cycle magnetism is so changed in the fields that the same attractive force appears at a in the accompanying diagram, and during successive instances at b, c, d, etc., setting up a magnetic revolving motion.

A piece of iron located in a central position relative to these poles, and if supported in bearings will revolve at the speed of magnetization or at a speed to correspond to the speed of the current, i.e., the number of cycles per second. The only method of varying the speed of an induction motor is to wind it with two sets of field coils, doubling or halving the number of revolutions per minute. The armature is pierced with heavy wires or bars to carry the induced currents. Seven or eight times as great a starting current is required as is required to run the motor ordinarily.

The following is a classified list of best known makes of dental motors:

SERIES WOUND TYPE.

Electro-Dental.

Ritter.

Leighton-Jackes.

INDUCTION TYPE.

Emerson.

Victor.

Westinghouse.

SWITCHBOARD INSTRUMENTS.

The Switchboard and its accessories have of recent years received a prominent place among dental equipment; so much so, in fact, that it is of almost universal interest to understand the function of each instrument and how it is operated.

Much comment and discussion occurs as to the utility of these appliances, and this usually arises from the lack of knowledge of just what these instruments are used for and how they are handled. To obtain the desired results they must be used with the same precision, skill and scientific research as other instruments in the performance of all dental operations; and in the hands of good men the value of each man's time is increased and pleasure added to his work.

It is the aim in this article to picture the different instruments more commonly used and give an outline of their usefulness, but before doing so it might be well to give a brief sketch of the Switchboard, to refresh the memory of those who are not well acquainted with it.



Fig 1—Switchboard

Figure 1 represents a standard type of Switchboard, the main function of which is to reduce the high voltage current for the low voltage instruments. This is controlled by the differential rheostat and mouth lamp rheostat, as shown on cut. The Switchboard also serves the purpose of concealing within itself all the necessary wiring and all the switches, fuses and rheostats that are required (with but one connection from outside wires), to operate and control the entire equipment; at the same time it provides outlets for

distributing the current to the various full voltage appliances that are used near the chair, such as the Engine, Water-heater, Atomizer-heater, Sterilizer, Gold Annealer Furnace, Fan, etc. It also regulates the pressure of compressed air, so that the Hot Air Syringe can be intelligently used. This switchboard is usually placed in a convenient position to the operator. The instruments are also hung conveniently, depending mostly upon the layout of the office and the taste of the dentist; in this respect the ingenuity of the operator plays an important part.

The Switchboard, then, is the centre of distribution for wires leading to the high voltage apparatus, and is the means for controlling the low voltage instruments used in the mouth. The design and construction of the Switchboard was discussed at length in the May, 1910, issue of THE DOMINION DENTAL JOURNAL, and it is the intention here to discuss only the low voltage instruments.

The following list comprises those instruments which are more commonly used:—

The Mouth Lamp, Antrum Lamp, Root Canal Drier, Gutta-Percha Heating Points, Bleacher Points, Wax Spatula, Cautery, Hot Air Syringe.

MOUTH LAMP.

The Mouth Lamp consists of a small incandescent lamp inserted in a nickel-plated holder to the side of which is fastened a mouth mirror, and on the handle, conveniently located, is a switch, by means of which the current can be conveniently turned on and off.



Fig. 2—Electric Mouth Lamp

Figure 2 represents the mouth lamp (C), being the electric lamp bulb (D), the mirror, and (E) the switch.

The Mouth Lamp can be used while operating like an ordinary hand mirror without any discomfort to the patient on account of heat. For diagnosing dead teeth the Mouth Lamp is surer than the temperature test, and is very useful when examining approximal cavities, locating exposures or finding the orifices of canals. This instrument can be operated from storage batteries, Edison primary cells or from a switchboard, the standard requiring about eight volts to operate. They consume very little current, only a fraction of an ampere.

It is essential to the successful operation of these lamps to have the voltage under control, the filaments deteriorate in time, and it is, therefore, necessary to be able to increase the voltage so as to maintain the desired brilliancy.

When the mouth lamp was first introduced they were operated

by means of batteries or by a reducer from the high voltage line; both of these methods proved unsatisfactory. The introduction of the Switchboard, however, eliminated the trouble experienced, for by its use the voltage can be regulated to the desired amount.

To light the lamp, switch A is moved towards the bulb. Should the lamp burn out a new one can be inserted by unscrewing the bulb C. This is done as quickly as replacing an ordinary incandescent house lamp. The size of the lamp is very small and neat, being only $\frac{5}{16}$ of an inch in diameter, so that it is not inconvenient to handle.

ANTRUM LAMP.

The Antrum Lamp is used to detect diseases of the antrum by means of trans-illumination. Abscess areas are sometimes indicated and root fillings can be detected. The instrument is used with the lips closed and in a darkened room gives a very effective illumination of the tissues. The standard lamp produces about fifteen candle power; and, being covered with a hood reflector, it gives a powerful light in one direction.



Fig. 3—Antrum Lamp

The lamp requires about 10 volts to operate, and on account of the current consumed can be successfully operated only from a switchboard. It is controlled and operated in the same manner as the mouth lamp.

ROOT CANAL DRIER.

The Root Canal Drier has a fine flexible point, capable of traversing any canal that can be cleaned by broaches. The instru-

ment is usually made of silver, which is an excellent conductor of heat, and does not corrode readily. It may be inserted in the canal cold and then heated, or it may be heated before insertion. By regulating at the switchboard any degree of temperature may be obtained and the desired heat maintained.

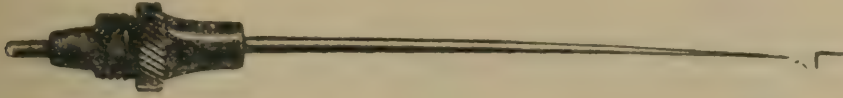


Fig. 4—Root Canal Drier.

Figure 4 illustrates this instrument. The switch handle is the same as that required for mouth and antrum lamps. The heat is generated in the tubular portion, and has an electric heater, consisting of a loop of platinum wire within the tube, and the whole is so constructed that the heat radiates towards the point. This requires about 4 volts to operate and consumes from 1 to 2 amperes of current.

THE GUTTA PERCHA INSTRUMENTS.

The Gutta Percha Instruments consist of an Excavator, left hand (E), an Excavator, right hand (F), and a Ball Point (G), as shown by Figure 5.



Fig. 5—Gutta Percha Instruments

These instruments are used in softening Gutta Percha and in working the material in the plastic state. The heat is generated within the instrument in a similar manner to the way it is generated in the root canal drier. By regulating the voltage at the switchboard the resultant electric current maintains an even temperature, variable at the will of the operator. Since there is no flame or heat apparent, nervous patients do not flinch from the use of such an instrument as they do from one heated in a flame.

The ball point (G) is often used when raised to high temperatures in softening amalgum fillings to facilitate removal. These instruments operate at about 4 volts and consume from 1 to 1½ amperes of current.

THE BLEACHER POINT.

The Bleacher Point consists of a pointed instrument similar in construction to the Gutta Percha instruments. This instrument is used to hasten the action of pyrozone in bleaching. To prepare a tooth for bleaching: Dry the canal and fill the upper part to prevent trouble at the apex. Warm the tooth thoroughly with the Hot Air Syringe and introduce the pyrozone either upon cotton or paper, then insert the heated bleacher point, being careful not to have it so hot as to ignite the pyrozone. The material is rapidly volatilized and by this method bleaching is accomplished in from 2 to 5 minutes. As the bleacher point is heated electrically, there is never any uncertainty as to the temperature, the switchboard rheostat giving perfect control. The tubular portion is made entirely of platinum to avoid imparting metallic stains to the tooth. Bleacher points can also be used for recessing impressions to make gold inlays hollow. All of the instruments but the tip should be wrapped with cotton, which will absorb the melted wax and prevent radiation. What ordinarily is a difficult operation is easily accomplished in this way. It requires about three volts to operate and consumes about 1 ampere of current. Fig 6 pictures a bleacher point. This instrument is used in the same switchhandle that the antrum lamp is used in.



Fig. 6 - Bleacher Point

THE WAX SPATULA.

The Wax Spatula will be found very useful in waxing up a

plate, and can be used for working gutta percha. It consists of a flat thin metal point, as shown by figure 7.

K



Fig. 7—Wax Spatula

This instrument is sometimes used to assist bleaching operations by applying the flat side to the outside of the tooth. The instrument is indispensable for heating and removing crowns that are set with gutta percha. It requires about 4 volts to operate and consumes about $1\frac{1}{2}$ amperes of current.

THE CAUTERY.

The Cautery consists of a loop of platinum wire attached to the insulated sections of the tubular stem, as shown in Figure 8.



Fig. 8—Cautery

It can be heated to an intense white heat, and is highly recommended for sensitive dentine. It is frequently used for cutting off gum tissues overhanging into cavities, which can be done without hemorrhage. It is also used for puncturing abscesses, arresting hemorrhages after extraction, and stimulating old sockets that are slow to heal. The cautery requires more current than any other instrument. When the voltage of the switchboard is reduced by means of a transformer a consumption of current is about 48 watts, but where it is reduced by means of resistances current consumed is in the neighborhood of 1,000 watts. It is, therefore, important in purchasing a switchboard to purchase the correct one, since they are not all constructed alike.

HOT AIR SYRINGE.

The Hot Air Syringe is the most useful of all the accessory instruments. To use it properly the flow of heat through the heating coils should be under control. Some makers of hot air syringes have them arranged to operate on the high voltage only, which is a mistake, since the temperature of the air cannot be regulated at the will of the operator. For the successful operation of the hot air syringe it is essential to have the heat and pressure of the air under absolute control of the operator, and in order to do this it is necessary to have a switchboard by means of which the pressure and voltage can be regulated to any desired amount. It is impossible to regulate the pressure by operating only the tap on the air pipe. It is necessary to have a regulator having a diaphragm and valve in equilibrium such that if the pressure increases, the valve closes, and *vice versa*. These are essential points, and will be apparent to those who give the matter sufficient thought.



Fig 8—Hot Air Syringe

Figure 9 shows the Hot Air Syringe having a visible heating coil inside the air chamber (A). The wires are led to this coil through the tubing and the electricity instantly heats the coil, thus warming the air passing through it. The electricity and air are turned on simultaneously by rotating the part (B) to the right hand and both are turned off when it is rotated to the left. This insures against leaving the current on when the air is turned off, which might burn the coil out, as the current of air keeps the coil at lower temperatures.

The instrument is most frequently used for drying cavities for examination and to desiccate canals and difficult cavities before filling. The hot air syringe is so effective and quick that in many minor operations the use of the rubber dam can be avoided. It is convenient for evaporating solvents and for hastening the setting of cements, for inlay work and drying abutments, for crowns and bridges it is equally helpful.

By thoroughly drying the dentine, excavation is made less painful, and with the hot air syringe it is possible to obtund sensitive dentine, beginning with the application of a jet of air at one pound pressure warmed to blood heat and continuing while temperature and air are gradually increased to the maximum point consented to by the patient.

For examination of pyorrhea pockets a jet of warm air from the hot air syringe can be used for lifting the gums, but for this purpose heavy pressure is required.

Dehydration with the syringe renders the application of all medicaments more effective. In the treatment of pulpless teeth this use of the hot air syringe is most important, laying open the tubuli and septic matter in canals to the action of germicidal agents. For forcing dressing through canals into abscesses and fistulae the hot air syringe is almost indispensable; and for stopping hemorrhages after lancing it will be found very useful.

GENERAL AND ORAL HYGIENE IN THE ROYAL COLLEGE OF DENTAL SURGEONS, TORONTO, CAN.

A. E. WEBSTER, D.D.S., L.D.S., M.D.,

Professor of Operative Dentistry and Dental Pathology
Royal College of Dental Surgeons.

Having been asked several times by teachers and those interested in dental education for an outline of the course in Oral Hygiene in the Royal College of Dental Surgeons, the writer thought it might not be uninteresting to those in general practice to see what is now considered a course in this subject. With the consent of Professor Clarkson, an outline is first given of the course in general hygiene from the standpoint of the physiologist. It is being recognized more and more each year that hygiene, and especially oral hygiene, should constitute a large part of the instruction given in a dental college. The Royal College of Dental Surgeons has recognized the importance of this in the layout of its new building and in the arrangement of its courses.

During the first week of the freshman's term at college Professor Clarkson delivers two lectures on general hygiene, with special reference to student life and the dangers of venereal diseases. In the general lectures the details of hygiene for dentists is discussed.

PRELIMINARY LECTURES.

General care of body during period of student life. Ventilation in bedroom, hours of sleep, exercise, bathing, clothing, food in its relation to common student conditions, such as constipation, venereal diseases, gonorrhea, soft chancre and syphilis, immediate and secondary dangers, general prevalence in all cities, symptoms of these diseases, "the fear of syphilis is the beginning of wisdom." Prophylaxis and treatment.

GENERAL LECTURES.

Foods in relation to health, dangers of excess, virtue of simple diet. Hygiene of mastication and of digestion, necessity of a constant supply of fresh air. Tuberculosis and how to avoid it, deep breathing, alcohol and tobacco, patent medicines and their evils, exercise and its relation to the cardiovascular system, the care of

the eyes and ears. Surgical cleanliness and its relation to the health of the dentist.

ORAL HYGIENE.

The course in oral hygiene begins in the first week of the first year and continues throughout the whole four years. The ground is taken that a dentist is in a poor position to advise and teach oral hygiene to his patients who does not himself practise it. The very first duty of the staff to the student is to start him to care for his own mouth. A lecture is given to the class much along the same lines as a lecture on this subject to a public audience. At the close of the lecture each student is asked to select a junior student who will take care of his teeth during the next two years of his college course; after that time a student in his own year must care for him. The student is sent to the regular examining room of the college, where a chart is made out in duplicate; one is put on file in the office and the other is the regular working chart of the infirmary. The chart is very complete and accurately made out. Especial care is given to the condition of the gingivae and the mucous membrane. Any student who has not selected a dentist from the junior class at the end of two or three weeks has one chosen for him by the professor.

EXAMINATION CHART.

The junior student is expected to give his patient a prophylactic treatment and give him the necessary instruction in the care of his teeth and mouth. In fact he is held responsible for the condition of his patient's teeth at all times while under his care. If a student does not do his part in caring for his teeth after he has been instructed and advised to do so the operator must so report to the chief of the staff, who will look into the case. It is not expected nor is it necessary that a junior student operator shall perform difficult operations for his student patient during his junior year, but may do temporary operations, and in his final year do the difficult ones. At the close of the first year each student is asked to write an essay on the formation and arrangement of the teeth as related to the cleanliness of the mouth and the prevention of decay of the teeth.

At the beginning of the course in operative dentistry in the sophomore year four or five lectures are delivered on the general subject of bacteriology and the relation of bacteria to dental caries and to the general health. A couple of lectures are given on the development of the teeth and one or two review lectures on the anatomy of the mouth and teeth. Dental caries is now studied as fully as the student's knowledge will permit. Two illustrated lectures are given, showing the development, progress and consequences of dental caries and the methods of prevention as based upon the cause and present state of progress. With this introduction the student is taken into the laboratory to perform opera-

tions, to treat caries and its consequences. As most of the profession are familiar with this part of a dental course it will not be discussed now.

After the student has performed on dummies such operations as preparation of cavities and filling them with the various filling materials and treated the consequences of dental caries, he is asked to perform the operation of prophylaxis on his tooth form, then on extracted teeth and then on his companions' teeth, and then for patients in the infirmary. Each of these latter divisions of the course follows immediately upon the other. The sophomore student acts as an assistant to a senior student for a few weeks prior to beginning practice in the infirmary on his own account.

The technique of prophylaxis is taught in the laboratory by demonstration, first on dummies, then on patients, and by laboratory talks. Each student has a full equipment of instruments and appliances to use in his laboratory and infirmary practice. Just before the student goes to the infirmary an illustrated lecture is given on how to instruct a patient in the care of his own mouth and teeth. Tooth brush, dentifrices and a general oral hygiene regime completes the course in the sophomore year.

In the third year the subject is reviewed in all its aspects. Dental caries is gone into more fully than before and is studied from the standpoint of prevention by mastication, dietetics, environment, mode of living, local and general medication. Influence of alkalies and acids locally and the Low sulpho cyanite treatment generally. Clinics are given in the infirmary by the regular staff and by the professor. Introductory studies in pyorrhea alveolaris complete the course in prophylaxis in this year.

The course in the fourth year reviews all that has gone before and gives a series of illustrated lectures on dental caries, its progress and treatment. A full course in pyorrhea alveolaris, its prevention and treatment, and the relation an unclean and diseased mouth bears to general health. It blazes the way for the practice of dentistry on the broad principle of public health. The practice of dentistry is looked upon, not as filling holes in teeth or performing a few highly specialized mechanical tricks, but as an art based upon scientific facts, having for its object the relief of pain, preservation of health, prolongation of life and increase of happiness. What more inspiring occupation is there?

A series of illustrated lectures suitable for public instruction close the course. A chosen number of the students must during their final year write an essay of not less than three thousand words, which should be suitable for a public lecture on oral hygiene. Each student must read one of these essays and pass an examination in the subject.

PROPHYLAXIS IN THE INFIRMARY.

It has been the practice in the infirmary of the Royal College

of Dental Surgeons to insist upon the prophylactic treatment of the mouth and teeth ever since the establishment of the College. (It might be added parenthetically that the writer's opinion is that prophylaxis would have been generally practised in Ontario long before now if it had not been for the preceptor method of instruction of students.) No credit is given a student for single operations. Before a patient may be presented for examination the mouth must have all the necessary dental operations performed. The student is examined on what his conception of the practice of dentistry is as exemplified by the cases he shows to the examiner.

The chart for every patient is marked for prophylaxis. This is the first operation for every patient after the relief of pain. No fillings are inserted until the mouth is as far as possible put into an hygienic condition. The patient is instructed in the use of the tooth brush and receives a prescription for a proper brush. If a dentifrice is advised a prescription is provided. At each subsequent visit of the patient the operator is expected to see that the teeth are being properly cared for, and advice, suggestion and assistance given where needed. Every operation is made with an eye to maintaining a clean mouth and preventing decay and disease.

In a general clinic where all kinds of patients apply for treatment it must be expected that many come whose teeth have never been brushed and are in a state of filthiness. In such cases it is the duty of the operator to relieve the pain, give the patient an ounce of fine pumice stone, a prescription for a tooth brush, and some advice as to how to use them. It is not expected that students shall clean patients' teeth. After the patient has done what he can the operator is expected to remove the calcific concretions and polish the surfaces of the teeth and treat the gums. A patient who does not keep his teeth as clean as he should after receiving instruction is reported to the chief of the staff, and if he cannot be persuaded to do better the operator is no longer held responsible for the condition of the patient's mouth. In some cases we have refused to continue to operate for a patient who would not do his part. It must not be understood that powdered pumice stone is recommended to patients for a dentifrice, but it is given to patients whose teeth need one good polishing up. Grits are not recommended for daily use, neither are medicated mouth washes. These are used only upon the advice of the operator.

The appointment cards used in the Royal College of Dental Surgeons have printed on the back of them the following directions for the care of the mouth and teeth:

HYGIENE OF THE MOUTH.

1. To preserve the teeth from decay and keep the tissues of the mouth healthy it is necessary to keep the teeth and gums free from decaying food particles and to stimulate the circulation of the blood in the gums.

2. To assist in this masticate hard foods. Soft foods cling to the teeth.

3. Teeth decay chiefly at night.

4. Brush the teeth before retiring and upon rising and, if possible, after each meal. Rinse the mouth with an abundance of tepid water.

5. Brush the teeth from gums towards the biting edges.

6. Use mouth preparations and brush recommended by your dentist.

7. Consult a dentist as often as advised by him.

8. Good teeth and a clean mouth are even more essential to a child than to an adult.

CARE OF ARTIFICIAL TEETH.

1. Any appliance in the mouth tends to collect particles of food, which decay. Extra care should be taken in cleansing both the appliance and the teeth.

2. Partial dentures and the remaining natural teeth and the gums should be cleansed morning, night and after each meal. *Never wear partial dentures at night.*

3. Entire dentures and the gums should be cleansed morning, night and after each meal.

4. Special care must be taken with crowns, bridges and orthodontia appliances.

ONTARIO DENTAL SOCIETY, MAY 31, JUNE 1 and 2, 1911

Dr. A. Hordlicha, Curator of the Smithsonian Institution, of the United States National Museum, Washington, D.C., will give a lecture on "The Dentition and Teeth from a Racial Standpoint." Other papers will be given on "Orthodontia for the General Practitioner," "Pyorrhoea," "Preparation of Cavities under Specified Conditions," "Facial Neuralgia," "Tooth Bleaching and How to Treat Punctured Roots." All these papers will be particularly interesting, and it will be well worth the while of every dentist in the Province to hear Dr. Hordlicha alone. Don't forget the dates—May 31st, June 1st and 2nd.

J. A. BOTHWELL,
Sec. Program Com.

Dominion Dental Journal

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No. 3

MIGRATORY PATIENTS AND PERSONS WHO DO NOT RETAIN THE SAME DENTIST FOR LIFE.

A person who has been the patient of one dentist for a period long or short, may change. The motive prompting change may be good or bad; it may spring from intelligence and good sense, or from ignorance and folly, from honesty or dishonesty. But, whatever the reason it must be supposed that a patient expects to gain some advantage by such a change voluntarily made.

To those whose practise is not what they desire, to young practitioners and graduating classes, a few remarks on this subject may from time to time be usefully addressed,

Of the large number and variety of people who might be considered under this heading, space permits the mention of only a few more or less distinct classes as at present known to the dental profession.

The patient recommended by a leading practitioner in a

large city, because he has more call than he wants, is likely to be all right, and perhaps the best a young man may see for some time.

Of patients who call without credentials, the desirable sort ask for an *appointment*—not an immediate operation. Such a patient will ask to be examined, or say in some common-sense way, what he or she thinks may need attention, and does not complain of or perhaps mention her former dentist. If asked, however, she tells his name without hedging. She does not say how nervous she is nor how dreadfully she has suffered in a dental chair or elsewhere, nor does she put on a drawl or other affectation. What she may say does not sound like lies. She does not ask for fillings, crown or bridge, or enquire about your charges. However, should you discover need for extensive operations and so report, regard as a safe sign the question “about how much may I expect to pay?” and answer it. Many good people and some bad ones, however, will not ask this question.

If a patient presenting in about this fashion, is on time at the next appointment, do whatever is required, and do it well, for many years may pass before you have more of this kind than you can attend to.

The dead-beat mostly wears expensive clothes; may call without appointment, and may or may not expect immediate attention. Men of this sort use the glad hand, and either man or woman, hints the importance of their patronage, the friends they can send, etc. They are apt to be bold, but not frank or straightforward in manner, likely to want appointments changed or break them altogether and lie about the reason. These people get a servant to telephone to you for new changed appointments. They hedge if questioned about unfinished work, of which there may be evidence in the mouth. If they acknowledge experience with any other dentist in town, they disparage him and profess a decided preference for your way of practise, and also the intention of having their whole case treated in the best possible manner. This is the “society” or impudent dead-beat; but there are others.

The shoddy patient arrives wearing a Persian lamb jacket, a twenty-dollar hat, one or more four-dollar gold crowns with abscesses beyond, several badly decayed teeth, an intolerable deal of perfumery and a generally unclean mouth. She shops. She is congenitally ignorant and desirable only to the kind of dentist

who sells gold. Avoid such persons. They don't learn even by experience. They don't value their back teeth.

There is a class of boys or young men who loaf from the end of their compulsory working day—if they work—to the hour when rinks and moving picture shows close. At 10 o'clock p. m., or on Sunday, they have toothache and want relief. Don't go to your office for this sort without an extra fee, unless you want this kind of call to increase. Don't begin conservative treatment, unless the fee is paid on the spot. Such people will not keep an appointment. All dentists are alike to them.

A kind of patient may call who is not a shopper nor of bad intentions, clean and well dressed, but comparatively ignorant without suspecting it. Her former dentist charged only for material things used, or at all events managed the matter so as to leave this impression on her mind. As she considers herself quite well unto dentistry and dentists, having been a patient to one of the "best," she regards any charge for treatment of pulpless teeth, sealing, or instructions in oral hygiene as nothing short of daylight robbery. Fortunately this kind of patient is comparatively rare.

Then comes the shopper—the person who sees no reason to go to the same dentist always. Such a person is not necessarily poor, mean or dishonest, but merely proceeds according to the custom prevailing in the office or offices where she got her ideas of dentistry. These ideas have their origin in experience or discussions tending to show that dentists serve the inside of the mouth as tailors do the outside of the body, barbers the hair or milliners the heads of their customers—at so much per.

Evidently the shopping patient ranks tailors, milliners, furriers, jewellers superior to dentists—probably on account of the larger sums of money involved in transactions with the former. At all events the shopper generally does all *other* shopping before calling on the dentist, and consequently reaches his office late in the day, and usually without appointment. Between the hours of 4 and 6 p. m., where patients of this sort are the rule, they occupy the waiting room. Each awaits his or her turn with the more complacency because, to them, the number waiting argues the popularity of the dentist whose office they are in.

Few if any of our profession would profess a liking for this kind of thing. Many acknowledge the disadvantages of it, but seem unable to recognize the cause or find a remedy. Yet there

are in Canada men who have no shopping in their practise, which proves the thing is not inevitable.

It is quite safe to say that studious attention on the part of any dentist to the betterment of his own education, will sooner or later enable him to understand the nature of his vocation. By the time his education is thus far developed, he will probably have a clientele with no shopper in it.

W. C. G.

A PRACTITIONER'S COURSE AT THE ROYAL COLLEGE OF DENTAL SURGEONS, TORONTO.

At the annual meeting of the Board of Directors of the Royal College of Dental Surgeons of Ontario, April, 1910, it was decided to conduct a practitioner's course during the year 1911. The Board asked the Faculty Council to arrange the details of such a course and submit them to the Board of Directors at their meeting in April, 1911. After much discussion and conference with the programme committee of the Ontario Dental Society, whose meeting will be held the last day of May and the first two days of June, the Faculty Council thought the best time to hold the practitioner's course would be the ten days or two weeks immediately preceeding the meeting of the Ontario Dental Society. The choice of such a date for the course makes it almost impossible for the Board to complete the arrangements at their annual meeting and give time for the necessary preparation before the course begins. To overcome this difficulty the Faculty Council finished its part of the work and suggested that the executive committee of the Board make whatever arrangements demanded early action and complete the balance at the annual Board meeting.

The following suggestions from the Faculty Council were submitted to the representative of the Board at the college:

Your committee entrusted with the work of reporting on the proposed Practitioner's Course to be held in the summer of 1911, beg to offer the following recommendations:

(1) That the Board be urged to institute the course during 1911 immediately before the meeting of the Ontario Dental Society, closing with the opening of the O. D. S.; commencing Monday, May 22nd, at 1.30 p.m., and continuing to Wednesday, May 31st, at 12 noon, the O. D. S. dates being May 31st, June 1st and 2nd.

(2) That the hours be 8.30 a.m.—12, 1.30 p.m.—6 p.m., and 9.30—12 Saturday, making a total of 61 hours.

(3) That a fee of \$10.00 be charged, and Course to be open to all practitioners.

(4) That all lecturers and clinicians be Canadian practitioners.

(5) That the Course embrace the following:

Casting—

Inlays, various forms, including cavity preparation, etc. Various applications for crown and bridge work, including Carmichael and other attachments. Casting of various artificial dentures.

Operative Dentistry—

Latest developments, including among other subjects silicate cements, asepsis in dentistry, prophylaxis, immunity and susceptibility, pyorrhœa and minor surgical operations about the mouth.

Orthodontia—

Newest thought on this important subject, including the use of orthodontia appliances in the treatment of fractures, retaining appliances and splints.

Crown and Bridge Work—

Modern practice, including use of inlay attachments, moveable joints, removeable facings, removeable bridges and attachments.

Dental Therapeutics—

Indications for use, mode of application and effects of the most efficient therapeutic agents.

Prosthetic Dentistry—

Latest practical developments in anatomical articulation, use of bar in upper and lower dentures, proper retention of partial dentures, interdental splints, cleft palate mechanism, etc.

Extracting and Anæsthesia—

Including lectures and clinics on, and indications for the use of modern, local and general anæsthetics, as well as latest thought on subject of extracting.

Practical Bacteriology and Pathology—

Lectures will be given in conjunction with demonstrations, giving those in attendance an opportunity of seeing the various bacteria of the mouth, also their culture and differentiation. Microscopic demonstrations will be given, showing normal living tissue, effects of irritation, suppuration and similar phenomena connected with living tissue. A complete exposition of the most convenient

and effective means for maintaining asepsis in the dental office will be given.

That the time allotted for each member of the class to various subjects be as follows:

OPERATIVE DENTISTRY AND DENTAL THERAPEUTICS.

Dental economics and management of practice, investment	2	hrs.
Silicate Cements	2	"
Asepsis in Dentistry	1	"
Prophylaxis	1½	"
Immunity and Susceptibility	1	"
Pyorrhœa	1½	"
Minor Surgery of Mouth	1	"
Casting	5	"
Indications, Applications and Effects of Remedies	6	"
Education of the Public	1	"
		<hr/>
		22 hrs.

ORTHODONTIA.

Orthodontia	10	hrs.
Orthodontia Appliances for Practice		
Retaining Appliances and Splints		
		<hr/>
		10 hrs.

CROWN AND BRIDGE WORK.

Inlay Attachments	3	hrs.
Moveable Joint	1	"
Removeable Facings	1	"
Removeable Bridge and Attachments	1	"
Non-use of Bands and Shell Crowns	1	"
		<hr/>
		7 hrs.

PROSTHETIC DENTISTRY.

Anatomic Articulation	5	hrs.
Bar in Dentures	1	"
Interdental Splints	1	"
Cleft Palate Mechanism	1	"
Casting	3	"
Retention Partial Denture	1	"
		<hr/>
		12 hrs.

EXTRACTING AND ANESTHESIA.

Extracting	2	hrs.
Anesthesia	1	"
		<hr/>
		3 hrs.

PRACTICAL BACTERIA AND PATHOLOGY.

Bacteriology	6	hrs.
Pathology		
Asepsis in Dental Office	1	"
		<hr/>
		7 hrs.

At a meeting of the Executive of the Board of Directors it was decided that the Practitioner's Course should not be held until a later date than that of the Ontario meeting.

Editorial Notes

Dr. McLean, of Bancroft, is now practicing in Trenton.

Dr. McIntyre, of Medicine Hat, Alberta, is practicing in Gleichen.

Dr. J. C. King, B.E., W.S., 1910, has located in Humbolt, Alta.

Dr. Herbert McKin has taken over the dental practice of Dr. Rowe, Cobourg, Ont.

The dentists of Edmonton are alive to the need of dental care of the school children.

Miss Gilchrist has been appointed inspecting nurse in the public schools of London, Ont.

Two deaths under chloroform for the extraction of teeth have recently occurred in Montreal.

A Dental Society is in formation in the Huron Counties, Ont. The first meeting was held at Kincardine.

Dr. Jamison, of Edmonton, read a paper before the Central Alberta Medical Association on the care of children's teeth.

Dr. George McKay Sutherland has applied at this session of Parliament for a divorce from Annie Leo Sutherland, now of Buffalo.

The "St. Thomas Times" says that mothers bathe their children's bodies and comb and brush their fine hair, but rarely brush their teeth.

The medical health officer, of Edmonton, says the teeth of the children in the public schools should be inspected by a competent dental surgeon.

Dr. W. Nelson Cuthbert, of Brantford, is publishing a series of articles in the Canadian Century on the care of children's teeth. These are among the most attractively written articles that have yet appeared on this subject. The Century should be congratulated for having secured the services of so able an author.

Omer Hardgrove, a baseball pitcher of Calgary, last year lost many games because of ill health from bad teeth. His teeth have been treated, and he has recovered his former prowess.

The National Refining Company have left the old stand of 44 Adelaide Street, West, Toronto, and now occupy the new magnificent Kent building, corner of Richmond and Yonge. Room 704.

A complimentary dinner will be given by the members of the Southern Branch of the National Dental Association during its meeting in Atlanta, Ga., April 4, 5, and 6, to Dr. Frank Holland, of Atlanta, Ga.

No gutta percha solution is likely to be pumped the desired distance into a dry canal. Therefore, after drying a canal, moisten it to excess with oil of cajuput or pure volatile extract of eucalyptus, then put up in the solution.

The Forty-second Annual Meeting of the Kentucky State Dental Association will be held at Owensboro, May 25th, 26th and 27th, 1911. This meeting is to be the last State Dental Society to hold its annual meeting, according to the circuit established between Iowa, Illinois, Indiana and Kentucky; hence we expect to have an usually large exhibit, as well as a good program. All members of the profession are cordially invited. W. M. Randall, Secretary, Corner Brook and Broadway, Louisville, Kentucky.

At the annual meeting of the Institute of Dental Pedagogics, held in Washington, D. C., December 27th, 28th and 29th, 1910, the following officers were elected for the ensuing year:

President—Dr. Donald M. Gallie.

Vice-Pres.—Dr. H. E. Friesell.

Sec.-Treas.—Dr. Fred W. Gethro, 917 Marshall Field Building, Chicago.

The next meeting will be held in Chicago, and the time has been changed to one month later, the dates being January 24th, 25th and 26th, 1912.

The dentist who has the technical skill to use a brooch so delicate as to bear unlimited rotary motion while flexed at right angles with its own handle, is likely to be able to make the instrument for himself. **he cannot make such a brooch**, it is a sign that he could not make judicious use of one. Broaches of proper quality, temper, taper and fineness for use in this way are not for sale. They are made by the men who use them.

W. C. G.

Having the canals full of gutta percha solution insert the canes gently. Always stop when pain is felt. The same cone after a minute or two can be pushed a little farther without pain, and this should be repeated always allowing an interval for minute quantities of air and the liquid to be dispersed and for a partial solution of the cone in the liquid. Where foramina are not unusually large no harm will be done by a reasonable use of pressure to put the maximum of solid gutta percha into the canal.

W. C. G.

A smooth broach having $2\frac{1}{2}$ inches taper and made from the smallest English piano wire, so fine as to operate in buccal canals is, when wound with a few fibres of cotton, the best known instrument for extraction of pulps, cleansing of canals, and introduction of gutta percha solutions. This is the only form of instrument that can be safely and conveniently rotated in canals that are at right angles to the line of approach. The broach should have a very light and delicate handle of wood or vulcanide.

W. C. G.

In addition to scientific knowledge it is needful that a dentist have some taste — enough at least, to forbid the insertion of artificial incisors smaller and whiter than the natural teeth were. Where the lower natural teeth are present, upper incisors too small in size not only violate the most ordinary principle of taste but also render useful occlusion impossible, and cause irritating movements of the plate in use. How came the vulgar among women to think there is beauty in smallness of teeth? And why should any dentist ponder to this ignor-

ance? The supposition that there is beauty apart from proportion, in smallness of hands and feet is the bequest of feudal aristocracy—contempt of work. Development of hand or foot was held to indicate relation to the working classes and therefore a sign of social inferiority. We are unable at present to state the origin of the notion about the beauty of small teeth. But, for certain, this notion is not entertained by men of any sort, nor by women of any taste sense or culture, worth mention. Only the grossly, unclutured and altogether vulgar of women bother us about the size of teeth.

W. C. G.



W. H. Doherty, D.D.S., appointed Dental Inspector in the Toronto Public Schools. Duties to commence at once.

THE STANDARD BANK OF CANADA

Has very attractive suites of rooms suitable for dental offices over their branch offices at Avenue Road, opposite Dupont Street and Dovercourt Road, Corner Van Horn Street. Apply to the Head Office, corner Jordan and Wellington Streets.

Dominion Dental Journal

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TORONTO, APRIL 15, 1911.

No. 4

Original Communications

THE STATUS OF THE DENTAL SURGEON AND A PLEA FOR AN IMPROVED STATUS.

BY JAS. MAGEE, D.D.S., L.D.S., ST. JOHN, N.B.

Read at the Annual Meeting of the Army Medical Corps, Ottawa, February 14th, 1911.

*To the President, Officers and Members of the Association of
Medical Offices of the Militia of Canada:*

Gentlemen,—I ask your indulgence for a consideration of a brief paper on "The Status of the Dental Surgeon and a Plea for an Improved Status."

The status of the dental surgeon in the Canadian militia is inferior to that of most other branches of the service. It is almost the youngest branch, but is by no means the least important one.

The position of the dental surgeon is not satisfactory. He has no standing in any regiment, being but an attachee during periods of camps of instruction.

Qualification for his commission of Lieutenant is registration by his Provincial Dental Board. He is gazetted Lieutenant with honorary rank. He may receive the honorary rank of Captain in three years, but that seems to be the limit of his advancement. His duties are not onerous in camps of instruction, owing to the fact that in the short period during which the troops are assembled it is only the conditions which cause the men pain, and temporarily unfit them for duty, which are his immediate concern.

The equipment necessary for the relief and cure of all dental lesions would be too cumbersome to handle and too costly to furnish and maintain, simply for camps of instruction, and therefore a very much modified armamentarium has been provided by the dental surgeons in lieu of an equipment from the army medical stores. Necessarily, therefore, the opportunities for service to his King and his country are very limited in times of peace.

Attached to a permanent force, his services would, in his present

status, show to the best advantage, since he would care for and keep in good condition the mouths of all officers and men submitted to his special charge. This, of course, in times of peace.

During a period of hostilities, the time of all others when every man should be in a position to render his best efforts, the dental surgeon, because of his status, is the most useless officer of the militia. He is qualified only to care for mouths, and except for expert assistance in cases of maxillary fracture or gun-shot wounds involving the oral cavity, the requirements for his qualification tend to fit him for no other duties. Individually he may be capable of making himself useful in different directions, but this capability would necessarily, in a scheme where system is of the first importance, be of negative value. There is very little incentive to him to study to acquire knowledge of anything save purely dental subjects, as he is not allowed to take any of the examinations for field rank, required of all other professional officers of the A.M.C., and if by any chance, his misdirection of his O. C. at a camp of instruction, he should take that examination and make a creditable pass mark, he would be informed from headquarters that dental surgeons were not permitted to take this examination. He gets no encouragement for the effort to acquire knowledge or to fit himself as a more useful officer. To say the least he feels a bit discouraged.

Now I would suggest that in order to give that encouragement which will attract the best talent in the dental profession to apply for commission in the A. M. C., the rank and pay should be on the same basis as those of the medical officers. The dental surgeon should qualify for every advancement in rank equally with the medical officer, and he should be required to qualify in any subjects that will fit him equally with the medical officer for service in the field of action.

It ought not to be a difficult matter to modify the only objection I have heard to this equality of rank, which is that the dental surgeon might become an officer commanding a field ambulance. While this theoretically ought not to be an objection to any man who was thoroughly qualified to receive the appointment, in actual application it would be found an impossibility, unless there were more than one dental surgeon attached to a field ambulance. He could not attend to his professional duties and supervise his regiment as well. I would also suggest that the dental surgeon be attached directly to the field ambulance, being always subordinate to the officer commanding that unit. He would then have a certain individual and permanent interest in his establishment. *Esprit de corps* is one of the strongest chains to bind your officer. Let me modify the oft repeated patriotic quotation:

“Breathes there a man with soul so dead
That never to himself hath said,
This is my own—my regiment?”

It has been offered in argument that only in Canada are dental surgeons commissioned, even with honorary rank, in the army, and that we are in advance of all other nations. This is no argument at all, since, if the department of militia and defence is convinced that the service will be bettered by the change (and I trust that this effort of mine may be the means of a convincing argument to effect that result), it will be done.

It will not be many moons before the United States will have enacted legislation creating their contract dental surgeons regularly commissioned dental surgeons on an equality of rank and pay with the commissioned medical officers. Why not have Canada keep in the van of progress? This is not the only field in which Canada leads. To Canada belongs the distinction of inaugurating and successfully carrying out the provisions for granting the highest qualification in the world for the dental profession. Our Australian brethren and our United States cousins are now at work evolving a scheme for their respective countries upon the lines laid down for our national certificate. Why not establish the condition for the army dental surgeon in Canada, and let the other nations copy us? I do not suggest this with any desire to feel puffed up at the idea of our militia being in advance of any other country's militia (though even a feeling of pride in one's country and its defensive arrangements is pardonable), but solely with a desire to see that opportunities be afforded a capable officer making himself of greater use.

Now that our navy has become organized it will be necessary to provide dental services for the officers and men confined to the narrow limits of the battleship. The officers appointed for this service should be on an equality with the medical officers in every way.

CANADIAN DENTAL SURGEONS CORPS.

SUGGESTED IMPROVEMENTS BY G. K. THOMSON, D.D.S., HALIFAX.

1. Recommended: The organization of the C. D. S. Corps Active Militia. The C. D. S. C. shall consist of dental surgeon officers gazetted to the corps, and N. C. O.'s and privates enlisted therein.
2. The names of the officers so gazetted shall be arranged in the regimental lists of officers of the D. S. C. in order of seniority.
3. The number of the personnel of the D. S. C. shall be as laid down in the establishment list annually approved by the Governor-in-Council.
4. Rank, Pay and Precedence.—Officers will be entitled to rank and precedence and will be subject to the pay and allowance regulations, and to other advantages granted to corresponding rank of combatant officers; but rank or position will not, however, en-

title the holder of it to the presidency of courts martial other than regimental, nor will they exercise any military command outside of the dental surgeons corps, except over such officers or soldiers as may be attached thereto for duty.

5. Officer Administrating D. S. C.—The officer administrating the C. D. S. C. shall be the Director General Medical Services for Canada.

USE OF SCIENTIFIC KNOWLEDGE IN DENTAL PRACTICE.

BY W. C. GOWAN, D.D.S., PETERBORO', ONT.

To distinguish right from wrong, good from bad, in operative dentistry, therapeutics, surgery, prosthesis or prophylaxis, the thing needful is scientific knowledge. The method by which truth is distinguished from error is the scientific method; and the habit of mind leading to success in the study and practice of dentistry is the scientific habit; for the foundation of dentistry is science.

Mere dexterity and empirical knowledge serve well enough the mechanic or artizan whose work is planned, specified, directed and supervised by architect, engineer or other person of scientific education. But, without scientific knowledge the dentist cannot succeed: for in the nature of the case he must be his own engineer.

* * * * *

Proper management of cavity extension, margins, resistance, retention, contour and contact depends directly upon the operator's knowledge of dental anatomy, pathology, histology, physiology and physics, and indirectly upon other branches of science. Good or bad work in these particulars will be found to correspond with the operator's habit either of using knowledge of these several kinds or ignoring it.

* * * * *

Why do thousands of patients wear their artificial teeth night and day by the advice of the dentist or his indifference or failure to advise at all? There is only one conclusion, viz., The dentists in charge of these cases lack that knowledge of pathology, physiology and bacteriology which would enable them to perceive or understand the reason why plates should not be worn at night or at times when they are not needed in the mouth.

The plate of an artificial denture is, at best, an irritant. When badly fitting or unclean or both it is a severe irritant. It is a foreign body interfering with the functions and consequently the health of the mucous membrane in contact with it. It retains more culture medium for bacteria, which thus generate more poison than the mouth would produce without it. The more constantly it is worn the more injury it will do to the general health of the

patient and to the health of those tissues covered by the plate, and to the natural teeth adjacent, if it is a partial denture. Less injury, generally, and less than half the injury, locally, would be done by wearing the plate only half the time. Rest by night, from irritation suffered by day, is necessary to any tissue—even that of the feet. Therefore, artificial teeth should be worn only for mastication, conversation or appearance, and for these uses need not be worn twenty-four hours a day.

* * * * *

Why are needless, hazardous, ruinous or vain attempts made to ream or drill root canals to their apices, or at all? It may be want of natural aptness or of training in delicate technique or want of experimental acquaintance with the behavior of instruments or materials used in the preparation and filling of root canals. Such bad practice may sometimes be ascribed to insufficient knowledge of dental anatomy or to ignorance of the published results of study in matters concerning treatment of root canals.

The less of fermentable, soluble or irritating matter and the less unfilled space allowed to remain in a root canal, the better. The less irritation of the tissues of the apical space the better.

Materials most suitable for root-filling—gutta-percha preparations—are not impervious to moisture nor to bacteria, nor do they, except in a few favorable cases, entirely fill the canals at the time of insertion. The liquid constituents, such as chloroform, essential oils and the like, are soon dissipated, so that eventually most gutta-percha root-fillings are slack as well as porous. Hence enlargement of a canal is likely to provide more rather than less unfilled space after the so-called root-filling is inserted.

Small branches or shreds of pulp which remain in spite of the best efforts to remove them will when quite dry occupy but a small fraction of the space within the canal. Part, at least, of this space can be filled with liquid and small cones. This treatment of a small crooked or flat canal is, upon rational grounds, to be preferred to that based upon the supposition that all pulp or other undesirable matter can be safely removed by drilling, or that a canal so enlarged will be more effectively filled.

* * * * *

Why does anyone lecture or write about “hermetically sealing” apical foramina, root canals, or carious cavities—the latter with cement mixed so thin as to flow into the cavity without pressure? “Hermetically seal” a basket with a napkin!

Is a human tooth “hermetically” sealable? Will any known dental cement “hermetically” seal anything? If so, how, when, where and by whom was it tested to prove this quality?

Does not *seal* express all, alas! too often more, than is accomplished in a tooth? And may not “hermetical” well be left to its

proper use, which is to express that complete closure of thermometer tubes or other glass vessels effected by melting the glass?

THE SURVIVAL OF PRIMITIVE CONCEPTIONS OF DENTISTRY.

A 20th century graduate now practicing in Ontario recently inserted a gold filling in a lower incisor of a boy 12 years old. The operation, it seems, was the beginning of treatment in a case of caries involving most of the molars, bicuspid and incisors. Several pulps, one abscess and in all twenty-two carious cavities were in need of attention at the time.

Considering the patient's age, the nature and extent of the carious attack, the development of the tooth, and its supporting tissues at this time of life, and the interests of the patient in all ways, the beginning made argues bad judgment, bad policy, lamentable ignorance of science and general incompetence professionally.

Were this incompetence due merely to weakness of intellect and consequent inability to learn no discussion would be called for. But such is not the case apparently. The gold filling, as a mechanical work, is apparently of fair average quality, as trade fillings go. Appearances now indicate death of the pulp, of course; but this is not a mechanical matter. According to current report the man is busy, and has been so for years, being much given to labor in his office by lamplight. He is neither rich nor notorious, and is not reputed dishonest nor a fool.

The case is simply one of trade practice, unfortunately not unique even among twentieth century graduates. Our interest in it is chiefly to enquire why or how this primitive notion of dentistry has survived the light of science and the efforts of modern educators and still governs the practice of any recent graduate. To remedy an evil we need to know its source.

Is it not to be expected as a matter of cause and effect, that a student in the atmosphere of practice that is a survival of the trade of other days will, by reason of this experience, consider dentistry a mechanical and commercial pursuit? Does not the student usually consider his preceptor the greatest dentist in the country and himself *initiated* into the secrets of what dentistry is and what it is for? Does not such an office initiation tend to the subsequent belief that only mechanical work is "practical" and that scientific work is an imposition to be disposed of in a perfunctory way? Do not many students cram their science for examination, while impatiently awaiting their opportunity to make inlays, fillings, crowns, bridges, which they think "practical" and to which they do not perceive the relation of science? In short, is a view established by *example* in an office likely to change by *precept* in a college, before the time to study elementary science is past?

Now, is it well to further perpetuate this primitive view of dentistry by putting students in touch with it during summer

while our \$150,000 school stands idle? Thousands of poor children in Toronto suffer for want of those services students could, and ought to be taught to, render in this school. The advantage to students of a summer course of clinical instruction in the infirmary is sufficient to warrant the beginning of such a course at once.

If education of the public is sincerely desired, then what could be more effectively educational than experience of the benefits of dentistry by thousands hitherto without such experience? If dentistry is to attain its rightful place in public estimation, it must get a divorce from trade and train students in preventive and conservative practice to the total exclusion of the other kind. In the present situation the School of Dentistry is the only institution fitted for this work. Why not use it?

AN ELECTRO-DENTAL POSSIBILITY.

MARK G. McELHINNEY, OTTAWA, ONT.

(Written for the Dominion Dental Journal.)

Fate or Destiny, or whatever one may call the sequence of events in human life, plays many pranks with us all. Youth is full of energy, ambition and hope, and builds thereon many noble plans. As age advances we imagine that we acquire wisdom and become prophetic, more especially with regard to the outcome of the youth which surrounds us. Nevertheless, events often confound the wise who are prone to prophesy regarding matters of which they are ignorant but will not admit it.

The writer had youthful ambitions to become an electrician, and was already an apprentice to the Royal Electric Company of Montreal when Fate played one of her pranks, and May, 1886, found him a student of dentistry. It is easier to state a fact than to explain it. Change of occupation does not change one's nature; no sooner did I begin to see into the requirements of my new work than there came the desire to apply electricity to its purposes.

As early as 1887 I tried to force drugs into the dentine by means of an electric current, but success was denied because of my ignorance regarding drugs. I had never even heard the word "cataphoresis." The same year produced my first electro-dental engine, a crude affair, made by rewinding and adapting an old telephone magneto, and operated by a six-cell bichromate plunge battery.

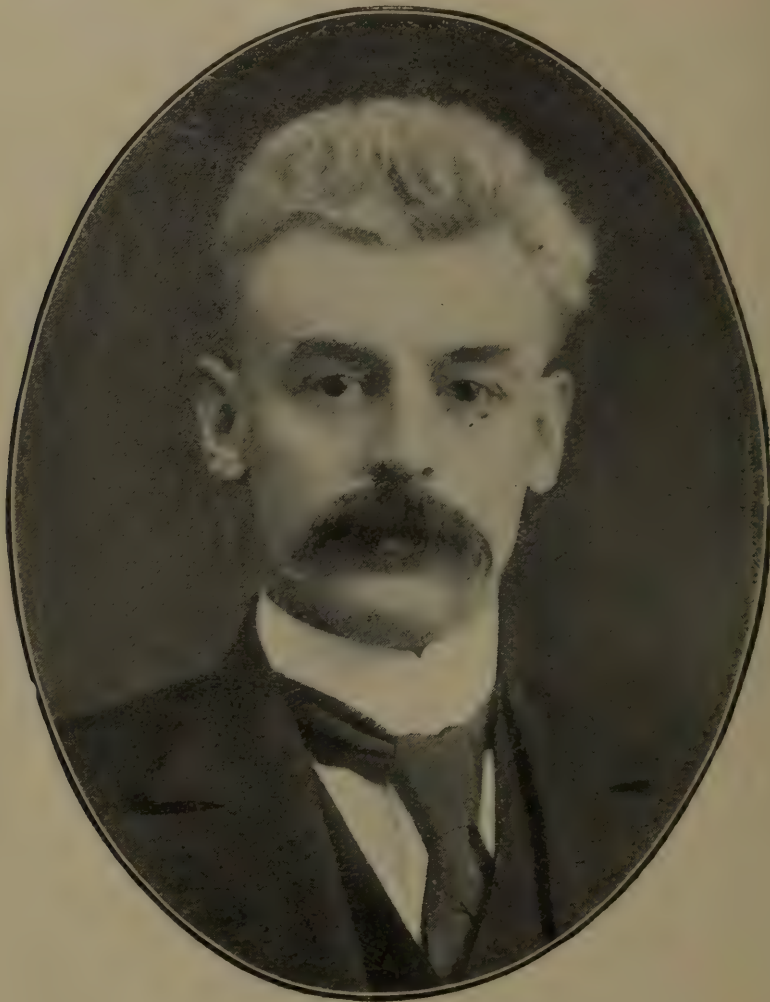
A few months later I produced a more serviceable motor, built on the Gramme Ring style, and considered the result as promising. In those days we had neither incandescent nor power circuits, so that all small motors had to rely on batteries.

Like the poor inventors in the story books, I took my model and

drawings to a dealer and manufacturer, offering him a half interest if he would pay for the patents. A dental student has no cash to invest, and I was no exception. The aforesaid dealer saw nothing in it, only a doubtful utility and no possibilities.

I tried to tell him that some day we would have power circuits all over the country and would even be able to take our little can and buy a quarter's worth of electricity at need.

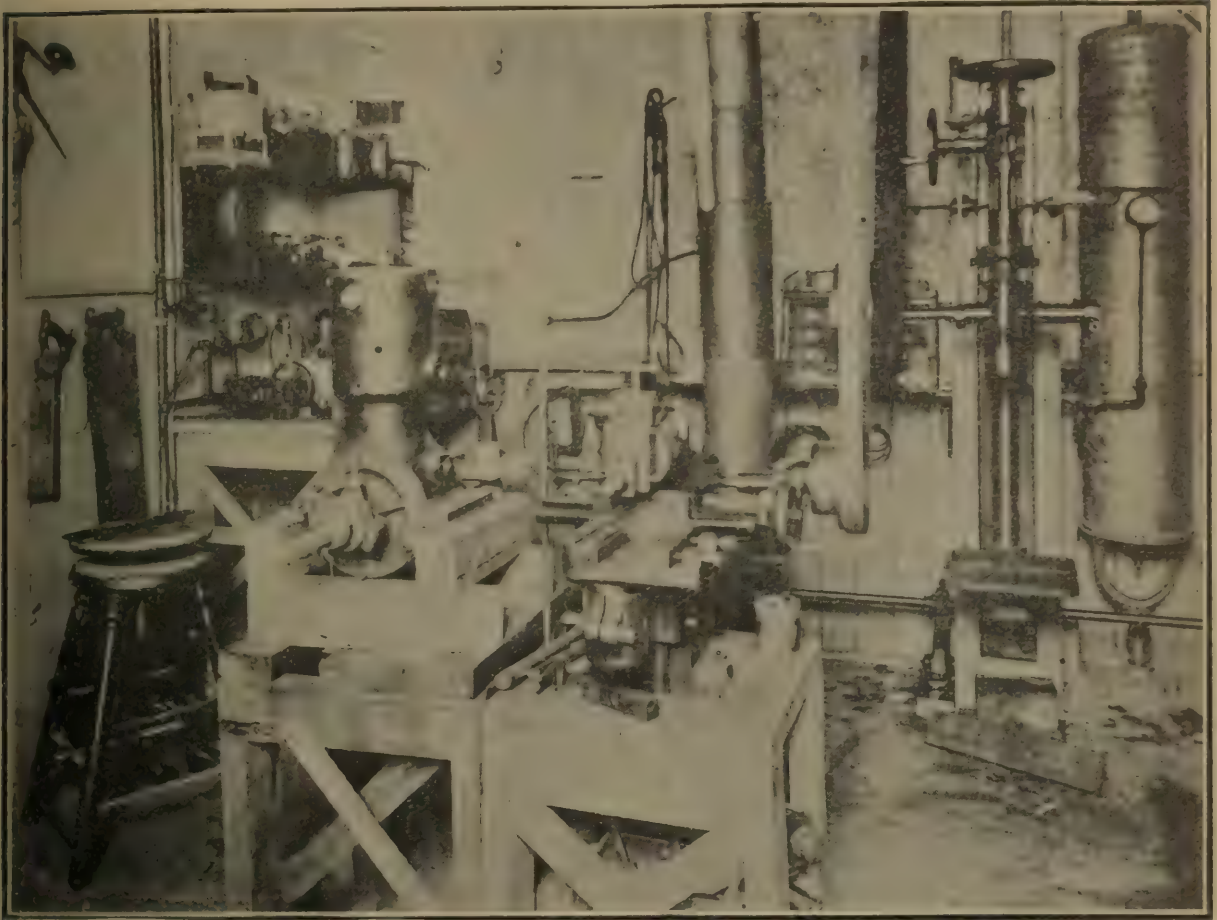
He smiled wisely, as age is apt to smile at a youthful dream, gave me some good advice and let the chance of a lifetime slip by.



MARK G. McELHINNEY, OTTAWA, ONT.

The outfit went up on the shelf, as I did not know what else to do with it. From this time I bent my energies to the acquirement of a small experimental shop or laboratory, in which has been spent the happiest hours of my life, tinkering at a variety of things. I built wind motors, water motors and impossible motors, steam and gasolene engines, electric motors and dynamos, acetylene lamps, air compressors, telegraph and telephone instruments, micro-photographic appliances, cameras, amalgam testing machines, casting machines, and many others too numerous to mention. In 1893 I invented an hydraulic governor, but could get no one to take it up.

Seven years later an American patented the same device and made a fortune out of it.



DR M'ELHINNEY'S SHOP.

I have been asked how I managed to get time for all this. My profession claimed and has been accorded full office hours, and the other work was done after hours and on holidays. Otherwise I would have starved to death long ago. No amount of money could buy the pleasure that I have taken in this work. Enough of the personal history of the struggles of an inventor. Unless one has health, hope and infinite patience, inventing is better left alone. These things I have and to spare.

Several years ago, when working at wireless telegraphy, it occurred to me to try the effects of various electrical conditions, accompanying certain forms of electrical discharge, on the human body. I reasoned that the popular forms of electro-therapy were blindly empirical without reference to the relations between the currents used and human metabolism.

It is generally admitted that electricity underlies all of the phenomena of nature and that all matter and motion may be expressed in its terms. The application of a simple electric shock may stimulate and make the patient feel that something is happening, but such is crassly unscientific.

It is logical to conclude that electricity underlies life itself and the phenomena of animal motion and consciousness.

It is further admitted that the cells of the body exist in a state of electrical tension. It should follow that human metabolism is conditioned upon the phases of this tension.

It was the search for an instrument sensitive enough to register this tension in the body that led me to hope that some means might be found to transfer thought, the result of varying conditions in the brain cells, through the medium of an electrical instrument. While I did not succeed in this, I did find that certain forms of electrical discharge exercised an influence upon the nervous system and, through this, upon the circulation.

According to one of the latest authorities, the theory is this: "Just before a spark passes between two conductors, separated by air or other dielectric, the dielectric is electrically strained, that is, an electrical disturbance or displacement is produced in the surrounding region. About the same magnetic field is set up as though an electric current actually flows.

"When the spark does pass an oscillating current flows and an electro-magnetic field is set up around the path of current as an axis. This field restores part of the energy to the circuit, as the current dies away, and part is radiated into space.

"When the potential difference is equalized by the sudden discharge, the electric current in the dielectric is relieved and displacement currents, or electric waves, are sent out into space in all directions." (Vide I.C.S.R.I., p. 54.)

This is the genesis of the Hertzian waves used in wireless telegraphy.

To the apparatus necessary to produce these waves I have added a form of discharge which reduces or divides the wave production. The unit of this second discharge has not been named.



A caveat was taken out and a year spent in modifying the appliance and experimenting on the human subject. It was found that a nervous headache could be relieved in from ten to twenty minutes and insomnia in about twenty minutes. This form of discharge was found to act as a nerve sedative and was applied successfully in many cases of neurasthenia.

As to the possibilities of this appliance in the hands of the dentist, they are a matter of further experiment, but the following case may point in the right direction:

The patient was a chronic sufferer from neurasthenia and the accompanying neuralgia and insomnia. She was a bright, intelligent woman, one whom it was a pleasure to meet, yet one hour in the chair was a day's work in nervous energy on the part of the operator. She had recently returned from a sanatorium, where the usual treatment gave little result. She was lent an appliance as an experiment. The next day, having an appointment, she reported that she had taken a treatment on reaching home and the neuralgia disappeared. That night the treatment was repeated and resulted in a good night's sleep. At the appointment a very sensitive cavity at the gum margin of a lower cuspid was excavated and filled with Ascher's enamel. The operation took an hour and the patient was as calm and steady as could be desired. This was due to a good sleep, and the sleep was undoubtedly due to the treatment.

This is but one case and may not be at all conclusive, but I believe that there is a wide field in the study of the influence of current radiation on metabolism. There is a hope that we may some day be able to fortify our nervous patients and conserve that energy so necessary to ourselves in carrying on our work.

SYPHILLIS IN ITS RELATION TO DENTITION.

J. H. SPRINGLE, D.D.S., MONTREAL, CAN.

Read before the Montreal Dental Club.

This paper is a synopsis of a series of articles on "Syphilis in Its Relation to Dentition," by Dr. Cavallaro, which appeared not long ago in the *Dental Cosmos*, as well as a few remarks on the recent treatment of this disease. I shall not go into the history of the subject or the different theories as to the cause of the cuspal atrophies of the first permanent molars and the six front teeth, as Cavallaro's idea that the cause is nearly always syphilis seems to be supported by most of the evidence. As you are aware the micro-organism causing this disease was discovered by Schaudin and Hoffman in 1905, and called by them "Spirochæta Pallida." Experiment since then has proved them to be correct. It is considered that it belongs to the protozoa and morphologically to the same

category as the spirochætæ of recurrent fever, and of the many which flourish in the oral cavity. It is smaller than the others, and when alive appears as a fine spiral thread. In acquired syphilis the spirochæta pallida has been found in all the pathological products more or less abundantly, according to the greater or less contagiousness of the infection. It has been found in the blood, the lymphatics, the bone marrow, the spleen, etc. The spirochæta pallida is not only found in hereditary syphilis, but often in enormous numbers. The hereditary disease may be conveyed to the child by the spermatic fluid which is highly infectious at some stages, or by the infection of the ovum, or by the passage of the germs through the placenta, so the fœtus can contract the disease either from the father or the mother. After giving a long list of alterations and degenerations which may accompany this form of the disease, statistics are given of the enormous proportion of children born dead; out of 105 births noted by different observers 92 were born dead. According to German statistics 75% of the hereditary syphilitics die after the second year. If the virus is attenuated in the parents, pregnancy may be carried through, and the baby will likely show gummatous alterations. If the parents' disease has been properly treated the child is not necessarily infected with the germs, but simply by the toxic products of the disease in the mother. In this case a child may be born healthy and no visible symptoms appear until the age of puberty, when they will correspond in extent to the attenuations of the virus in the parents. The virulence of the organism is thought to be indefinite, as it has been known to go down to the third generation. In regard to dental stigmata the lesions vary as to the intensity of the infection.

Dentification commences.

First Dentition—Incisors and canines, 17th week; 1st and 2nd molars, 18th week.

Second Dentition—1st molar, 25th week; incisors, 1st month after birth; canine, 3rd and 4th month.

Keeping these dates in mind we may arrive at some important deductions.

1. As syphilis is at its maximum intensity during the last months of intra uterine life and the first three of extra uterine life, the teeth likely to be affected by it are the first permanent molars, which are the only teeth of the permanent set which begin to dentnify during the sixth month of intra uterine life. The incisors and canines which dentnify during the first three months after birth. The bicuspid (usually) and the second and third molars are quite immune and dentnify from the third to the twelfth year. A period when the virus is much attenuated or has disappeared. The deciduous teeth dentnify between the seventeenth and eighteenth weeks, the first period of uterine life, when the disease

rarely shows its activity, or if it does nearly always causes abortion. They are rarely affected, but when so are equally as significant as the lesions of the permanent ones.

2. As we know the time of appearance of the layer of dentine on each tooth, we can state exactly which teeth will carry the mark of the morphological defect through the disturbance of nutrition, if this disturbance occurs at a known period of intra uterine or extra uterine life or vice-versa, we can tell the time at which the disturbance must have occurred if the lesion is found on a given tooth.

3. Knowledge of the process of dentification is of importance to the diagnosis, not only to the chronology, but also topography of the dental lesions. Calcification begins at the cusps of the teeth, so that if a morbid cause affect the follicle at that time, that will be the part affected if later the lesion will be more or less distant from the cusps. The corresponding tooth on the other side will show the lesion in the same place. The lesions will be more or less extended and deep, according to the duration and intensity of the morbid influence. He has examined the follicle in the case of syphilitic children, and has found distinct changes both in the hard and soft tissues, and has also discovered large numbers of the *spirochæta pallida* in the follicle. He terms the syphilis stigmata "dental erosion," but clearly differentiates it from chemical erosion.

The different forms which the stigmata take are freely gone into, and should be read in the original article.

He also blames syphilis for theogival or highly vaulted arch, cleft palate, hare lip, etc., on account of the influence it has on the intermaxillary bones. Hutchinson made the claim that in hereditary syphilis there are disturbances of the eye, ear and teeth, singly or all three. In statistics collected by Sidler, Huguenin, Fournier and E. Fournier of over 600 cases of known hereditary syphilis, 45% to 48% had ocular lesions, 40% to 47% had dental lesions, 15% to 18% had auricular lesions.

Cavallaro, among a number of other cases, reports four cases of syphilitic stigmata on the deciduous teeth, and has also some cases of them in the third generation.

While as Dr. Kirk remarks, "It is not wise to say that nothing but syphilis will produce these stigmata," at the same time we know of nothing else that does so. The Wasserman test, which gives a positive reaction in most cases, cannot be absolutely depended upon to prove the presence of the *spirochæta pallida*. In any case, if the dental stigmata are present in young children coming under our notice, it is our duty to advise the family physician of the need of specific treatment if it has not been given. In the more recent treatment Dr. Ehrlich's "606" has been used with good effect, either alone or with mercury. It should be preceded by Wasserman's test, and not used if that prove negative.

It is supposed to act by destroying a portion of the *spirochæta pallida*, causing the production of antibodies which destroy the rest. As the *spirochæta pallida* is an animal parasite, not a vegetable organism, serum therapy could not be used. Ehrlich, with his arsenical compound, discovered something that, while very fatal to the *spirochæta pallida*, was not much so to the body in general.

The value of medication in the hereditary disease, and even in the tertiary manifestations of the acquired form, such as tabes and paresis, have been recently proved. I would also draw your attention to Metchnikoff's ointment (calomel and lanolin) for use in the office after working on a suspected mouth. Rub it well into any abrasion or cut and around the nails. It will prevent infection if used within twenty-four hours.

ELECTRICITY FOR DENTISTS.*

FRANK D. PRICE, L.D.S., D.D.S., TORONTO, CAN.

INTRODUCTION.

I stood on the shore one quiet summer's day and saw a log floating near by. Being inquisitive, I started to push the log down and up to see what would happen. I found that it would easily go down and up at a certain regular rate of motion or *vibration*, and not easily at any other rate. But what was more interesting, I noticed that it set the water vibrating and that waves passed away from it on each side, all moving at the same *rate of vibration*. Each wave also had the same *length* (a, in Fig. 1) and all had a regular though not the same *amplitude* or height (b). The waves were not only on

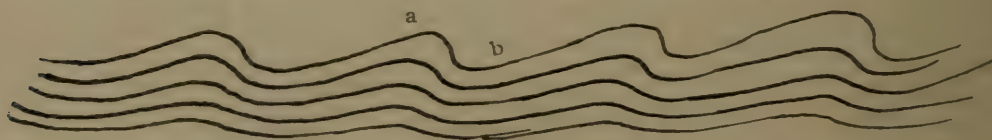


Fig. 1. Diagram of wave motion or vibration.

a, length of wave; b, amplitude of wave.

the surface of the water, for sediment at some depth also slightly moved backward and forward as each wave passed it. A gust of wind passed, throwing the surface of the water into ripples, so that the surfaces of the larger waves were covered with smaller waves. In addition to these two sets of waves there were broad waves rolling in from the lake whose length and amplitude were much larger than either of the others. At a little distance out a board was floating, and as each wave passing out from the log met it, it was caused to vibrate up and down. So there was a *transference of energy* first from my arm to the log, then from the log to the

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water, then from one part of the water to another, then from the water to the board.

Another illustration of the transference of energy from one form to another was seen in a passing steamer. Ages ago the sun by its *heat* and *light* had stored *chemical* energy in plants that formed the coal now being used. *Heat* applied to the coal under the boilers started in it a transference from a higher to a lower form of *chemical* combination, which difference was being given out in *heat* energy. This heat, conveyed to the water in the boilers, produced steam, which by its *mechanical* energy caused the rotation or vibration of the engines, which in turn forced the paddles of the propellers against the water and so moved the steamer against the resistance of the water and the air. A portion of the steam was conveyed to engines for driving *electric* dynamos, thus producing *electricity* for light,, also for driving the various motors in use and supplying electric current for the *wireless telegraph*. Thus by various transformations, energy in different forms was being used which was obtained from the sun long ages ago.

It is interesting to note the relationship that exists between the different forms of energy that we have some acquaintance with. All appear to be a form of vibration or wave motion in the ether, and no doubt are as definite as the water waves (Fig. 1), but infinitely more rapid. A flash of *lightning* will send out electric waves in all directions at the rate of perhaps one million vibrations a second. *Hertzian* waves that are used in wireless telegraphy have approximately 230,000,000 vibrations per second. We may yet learn that *gravitation* and *magnetism* are forms of vibration. They are somewhat alike. As we ascend the scale of rapidity of vibration we reach *heat* at say 100 degrees F., with twelve billions per second. With sufficient increase in rapidity the temperature increases until at about four hundred billion vibrations per second a dull red *light* appears. Passing up the gamut of the light vibrations, as we ascend we pass the various colors of the spectrum, red, orange, yellow, green, blue, indigo and violet. Here lies an interesting analogy between light and sound. Sound waves, however, travel in the sluggish air as if too slow for the subtle ether. But as a definite number of sound waves in air produce a definite tone, so a definite number of light waves in ether produce a definite color. Our ears were made to detect sound waves, our eyes to perceive light. We have not natural senses to observe all forms of energy, but we have constructed mechanical ones to indicate some of them. We note that the lower or red waves have little *actinic* or *chemical* effect, so the photographer uses them in his developing room. The violet have strong chemical or actinic effect, and as we ascend we pass the scale of *chemical* vibrations, which with increasing rate of vibration merge into the *Roentgen* or *X-rays* at trillions per second.

As in the case of the water we had waves of different forms exist-

ing at the same time, so we may have in matter different forms of molecular vibration or energy at the same time, as the light, heat and chemical energy in the burning coal. Any hindrance or resistance to the free continuance of any form of energy causes part or all of it to change to one or more other forms, as the resistance of the film in the incandescent lamp to the free passage of the electric energy changes part of it to light and heat.

The reader may have noticed that in the above classification electricity was left out. Then wherein does it lie? As we have shown that light overlaps heat and chemical mingles with light at one side and X-rays on the other, so electricity seems to cover all, if indeed they all be not but manifestations of electric energy. As money in commerce is a medium of exchange, so seems electricity in nature, because all the other forms of energy can be produced directly from it. It produces the lightning, the Hertzian (wireless) waves, magnetism, heat, light, chemism and X-rays. Then all energy is essentially one, but with different forms of manifestation. How simple. How helpful.

We learned in our chemistry that all compound matter is made up of molecules, each molecule being the smallest possible unit of a compound. That molecules may be broken up into atoms which represent the elementary substances. That the comparatively few elements by the various arrangement of their atoms form the multitudinous compound substances in the world. The most recent research goes far to prove that all atoms are made up of still smaller particles called by different scientists ions or ultimate particles or corpuscles or electrons. As a hydrogen atom is the lightest atom, it may therefore be also the smallest. Sir J. J. Thompson has shown that an electron is less than one seven hundredth the size of an atom of hydrogen. Electrons appear to be charged positively or negatively and to be moving with infinite velocity or vibration in infinitely small circles. Some conception of their energy may be shown from radium. A grain of radium radiates continuously energy enough to destroy photographic plates placed near it or to soon destroy life. Yet with this unceasing flow of energy it would take a mass of radium 1,760 years for its energy to diminish by one-half. The electrons of an atom move as freely in the atom as particles of dust in a room. Each atom is an electric battery, made up of as many units or cells as there are electrons in the atom. The polarity of an atom with relation to atoms of other elements is determined by the polarities of the electrons composing it. Thus we have the copper pole of a battery positive and the zinc negative in relation to each other in a battery cell. The fluid in the battery is a means of reducing this difference of electrical potential, and we lead out wires to obtain the electric current that is produced. Chemical energy assists in the exchange. If what we have said be true, then all matter is but varied combinations of one, and that

the ultimate particles or electrons. It is probable that either is composed of these.

The attractions of electrons to form atoms is determined by their electric charges or polarities, positive or negative. We know that like poles repel and unlike poles attract each other. In the grosser forms there appears to be no change of matter in relation to matter without accompanying electricity. The heavenly bodies as they approach or recede from each other produce electric disturbance. Evaporation of water and the condensation of the vapor in the air fills the air with electric energy. The lightning is but a return of some of it to earth. There is not a physiological action of animals or plants that is not accompanied by electricity. Some creatures, as the gymnotus or electric eel, have special organs for producing electric charges, by which they can paralyze a man or a horse. It may yet be shown that thought is as much electro-magnetic as the wireless telegraph. Electricity is so intimately related with all the phenomena of nature that to a casual observer it seems to be the tool with which the Almighty formed the universe and still controls it. And could ether waves be reduced to sound we would perceive that all nature is ringing with harmony.

THE TEETH, THEIR USE AND CARE.

BY A. V. LESTER, D.D.S., L.D.S., HAMILTON, ONT.

Read before the Hamilton Nurses' Alumna Association, March 7, 1911

Man, like many other of the mammalia, is endowed with two distinct sets of dental organs: one designed to serve the purposes of the economy during infancy and early childhood, the deciduous temporary or milk teeth; and the other, a larger, stronger and more numerous set, which replaces the deciduous teeth and is designed to serve the purposes of the economy from childhood to old age: these are designated as the permanent teeth.

Man is an omnivorous animal, and, as the term implies, eats all kinds of food. He has been endowed by Nature with organs of mastication suited to the requirements of cutting, tearing and grinding these various forms of food. Man's teeth therefore represent in part those of the carnivora or flesh-eating animals, and those of the herbivora or vegetable-eating animals: in other words, certain of his dental organs are representative of both of these types of animals. The incisors and molars are typical of the herbivora, and are suited to cutting and grinding vegetable fibre and grains, while the cuspids and bicuspid represent the teeth of the carnivora, and are adapted to seizing, tearing and cutting animal food.

The complement of the temporary teeth is twenty: the permanent, thirty-two: but in the latter case it is the exception instead of the rule to see an individual with the allotted number.

Teeth in man form a three-fold purpose: (1) Appearance, (2) speech, (3) mastication. In the first case their use is passive, in the latter active. Few people, indeed, know how to use their dental organs. The molars and bicuspid are of far greater importance, so far as the health is concerned, as they do all the masticating, and without thorough mastication we cannot have perfect digestion. The food must be so masticated that every particle of it is acted upon by the saliva before passing into the stomach. The saliva contains a ferment ptyalin, which converts starch into grape sugar. This change must take place before the food enters the stomach if we expect to derive much benefit from the starchy foods. Few people masticate their food sufficiently to give their teeth proper exercise. The food passing over and around the teeth in the process of grinding, keeps them polished to a certain extent, massages the gums in a way, keeping them hard and firm.

When the teeth are properly exercised in the process of mastication we have a greater flow of saliva, and the greater the flow of saliva the greater its alkalinity. Also the circulation of the blood in the tooth pulp, peridental membrane, gums and alveolar process is greatly stimulated. The teeth are cleansed by the saliva and food passing around and over them, and decay is prevented to a great degree. But if the food is bolted and washed down with water and other liquids the saliva becomes thick, ropy and acid from disuse and we have a condition favorable to decay. It is said that eighty per cent. of the cancers of the stomach are caused by bolting the food.

Every dentist has seen mouths in which the teeth on one side only were used, and has noted that the teeth on that side were in good condition and the gums healthy, while on the other side the gums were spongy and congested, bleed easily and the teeth become carious. The mouth is only the beginning of the digestive tract, and if this is diseased and unhealthy how can we expect to find healthy conditions in the remainder of it? It has been suggested that if children could be sent to a chewing school, as they are now sent to a kindergarten, there would be a marked improvement in the race.

Horace Fletcher, of whom you have heard so much, says we have control only over the first three inches of the alimentary canal, but if we use that properly the rest will look after itself. His advice is, "chew your food until the act of swallowing is involuntary," and he stands to-day a model of his teachings. One year ago last summer at Harvard University he broke every test of strength in spite of sixty years of age. Fifteen years before he was a physical wreck, rejected by insurance companies.

It is a deplorable fact, but nevertheless true, that the condition of the teeth of the Anglo-Saxon and European races is rapidly becoming worse. You ask why! The price we are paying for civiliza-

tion. Shall we become a toothless race, or what will be the outcome? Eight factories in the United States were occupied in the manufacture of 85,000,000 artificial teeth last year, and every artificial tooth placed in a mouth takes the place of one lost by carelessness; less than 25% of the people receive dental attention, and 8% use a tooth brush.

The dentists in America are alive to the situation, and have already started the campaign of oral prophylaxis. Perhaps you in your professional calling see a sad state in dental affairs. The famous Dr. Osler, of whom we as Canadians are so justly proud, made the statement before a class of dental students in London, England, "that decayed teeth has caused more deterioration in men than alcohol." Dr. D. D. Smith of Philadelphia, the father of oral prophylaxis, is responsible for having said last June in Toronto after visiting England, that if one thing more than another caused the downfall of the British race it would be the teeth of the nation. But I may say that they are in far worse shape than in Canada. Where does the remedy lie? Dental education!

In Germany, during conscription, the soldier is taught hygiene of the mouth. It is imperative that he brush his teeth and rinse his mouth on arising. In Germany also the state has opened dental clinics, employing dentists, and charging a nominal sum for services rendered school-children. The examination of school-children's teeth is compulsory, so, as in a great many things, Germany leads the way.

In a paper read by Dr. C. C. Kirk of Philadelphia before the Susquehanna Valley Dental Association, and published in *Dental Cosmos*, he says: It is now about twenty-five years since the importance of preserving the teeth as a public health measure began to attract serious attention, especially in Europe. The alarming prevalence of dental caries and the evident evil results, directly caused by the destruction of the masticating mechanism from tooth decay, attracted the attention not only of dentists, but of physicians as well. In Great Britain a systematic study of the mouth conditions of public school children revealed the alarming fact that only three or four per cent. had sound dentures, and that dental caries was an evil that was undermining the health of the nation. Similar studies in other countries furnished statistics which in general corresponded with the figures obtained in England, showing that dental caries is a disease practically universal in its distribution and constituting a factor of ill-health second in importance to no other which affects the human race.

Among the evil consequences of dental caries, the damage wrought by the disorder to the masticating mechanism was self-evident, and the train of nutritional disorders directly due to inability to properly masticate the food were quickly recognized. Chronic dyspepsia, intestinal indigestion and the auto-intoxication

caused by absorption of bacterial waste products developed in the fermenting masses of imperfectly masticated and infected food. were striking examples of pathological conditions, having their origin in a damaged masticating mechanism. But the evils resulting from imperfect mastication were by no means the only pathologic sequelæ of dentures damaged by caries. Further studies of the bacterial side of the question, notably by Hunter of London, furnished unquestionable evidence that decayed and diseased teeth were incubators of a variety of pathogenic germs, which, proliferating in and about carious teeth, found their way into the body, causing various disease reactions, many of them of a most serious and often fatal nature. Among the pathogenic germs which thus invade the body are the various pus producers, the bacillus tuberculosis actinomyces, the pneumococcus, Vincent's streptococcus and a variety of others, each of which is the known cause of serious disease. The discovery of these facts has given an added importance and significance to oral hygiene as a means for conserving the bodily health, and as a prophylactic against disease invasion. To stem the tide of this destructive influence there has developed from small beginnings a movement which to-day is practically universal, and which involves, generally speaking, the collaboration of the dental and medical professions, educational authorities, social workers and all who are concerned with the betterment of civic and social health conditions.

The principal object of this paper is to tell you about oral prophylaxis or hygiene, but before coming to that let me tell you about the dental diseases which do the most harm, and their etiology, for by knowing that the preventive treatment will be easier understood.

First let us take up the histology of a tooth. It is the hardest substance in the human anatomy. The outside covering is called enamel, being made up of hexagonal rods and intercemental substance. This covers the crown of the tooth and the dentine, which is the greater volume of tooth tissue. The dentine is composed of dentinal tubules, and each tubule contains a dentinal fibril, which carries the sensation from the pulp. The pulp (or nerve, as called by the laity) is composed of nerve, artery, vein and lymphatic, and corresponds in shape to the tooth itself. The roots of the teeth are covered by cementum, and the tooth is attached to the alveolus by the peridental membrane, which is made up of fibrous tissue.

Having learned something of the histology, let us proceed to see how it decays. The mouth has been described as the "prize bacterial garden of the world," having heat and moisture in abundance. The particular micro-organisms which cause decay do so in this manner: They attach themselves to the surfaces of the teeth by means of gelatinous plaques, and if they have a suitable soil to

grow in, such as a collection of food, and are not disturbed, their action upon the food causes the production of lactic acid. This acid dissolves the intercemental substance of the enamel and rods fall away, giving the micro-organisms a foothold. The enamel having been entered, they now proceed to attack the dentine, and as the dentine does not offer as much resistance as enamel, their work is much easier. The micro-organisms run along the dentinal tubules and at last the pulp becomes affected, and we have jumping tooth or pulpitis. The pulp now being affected, we have inflammation, and as you know in inflammation we have an increased amount of blood in the part. At every beat of the heart blood is sent into the tooth, and the pressure against the nerve causes pain. After a time this ceases, as the pulp strangles itself. Putrefaction takes place in the canals, and from this we have an alveolar abscess.

Pyorrhea alveolaris is a disease of the teeth rarely seen in individuals under thirty. If the disease is allowed to progress unmolested the teeth are always lost, as they become loosened. The cause is generally supposed to be an unclean mouth, but still it is seen in the mouths of some of our most careful patients. The chief cause is from deposits of tartar which gather around the necks of the teeth, pushing away the gum, and finally attacking the alveolar plate itself. In its final stages it takes on a very disgusting condition, as pus pockets are formed and the pus is being continually swallowed. The sooner this disease is taken in hand by a competent dentist the better for all concerned.

It is necessary in discussing this subject, to say a few words about the saliva. Normal saliva is alkaline, but it is not always normal. As related above, the saliva becomes thick, ropy and acid from disuse, and we have a condition favorable to decay. Most any dentist can tell at sight whether a mouth is acid or not. In an alkaline mouth we have more tartar, because in an acid mouth it is dissolved and not so much is deposited around the necks of the teeth. Tartar is composed chiefly of deposits of calcium salts from the saliva. It is found in greater abundance on the teeth nearer the salivary glands; on the outside of the upper molars, as the ducts of the parotid glands are right opposite.

Understanding now the principal diseases to which the teeth are heir, let us discuss the best means of combating them. The life of a tooth depends entirely upon its environment. Clean teeth do not decay nor are they infected with pyorrhea alveolaris, but, as you know, it is almost an impossibility to sterilize the mouth, still we can go a long way toward it. Decay goes on more rapidly from infancy until twenty-one years of age, and the teeth require more attention during this period than any other. Many a time you hear an individual complain that their teeth are too soft to hold fillings. Dr. G. V. Black of Chicago, after endless experiments, has found that the chemical composition of all teeth does not vary $\frac{1}{2}\%$. It

is in the structure of a tooth where the fault lies, and its environment, generally acid conditions. If the patient will have the environment corrected and place themselves in the hands of a competent dentist they can preserve their teeth for many years.

After birth, the hygiene of the baby mouth is important. It should be thoroughly cleaned by the use of sterile absorbent cotton and pure water, two or three times a day. After three years the child should be looked after regularly by a dentist to see that the mouth is kept clean and healthy, and the teeth filled where there are cavities, because the decayed places, if painful, cause the child to swallow the food without proper mastication, thus causing indigestion, stomach and bowel trouble. The use of pacifiers and rubber rings should not be permitted, as they convey micro-organisms to the mouth and deform the jaws. The seriousness of this is appreciated in France, where the Senate has passed a law prohibiting these articles.

As soon as possible the child should be trained in the use of a tooth-brush, and the habit, once acquired, will never be left off. None of the temporary teeth should be lost before their time, as they play an important part in the development of the jaw, and also guide the permanent teeth into their allotted positions. When the child becomes six years of age the permanent teeth commence to appear. The six-year molar, which erupts behind all the temporary teeth, is generally the first. This is the most important tooth in the head, and too much stress cannot be laid upon its care. It is the pivot tooth which guides all the other teeth into position, and, if lost, the chances are there will be an irregularity in the permanent teeth. The teeth of the child should now be watched with greater care to see that the temporary teeth are shed properly and the permanent ones come in their proper positions.

In the adult the hygiene of the mouth should be looked after by the dentist and the individual himself. The teeth should be brushed after each meal, and especially before retiring. During the hours of sleep the saliva is not flowing freely, neither is the tongue nor cheeks brushing the surfaces of the teeth, and the micro-organisms, being undisturbed, have a fine chance to do their work. The teeth should be brushed from the gums to the biting edges. The motion should be a vertical one, placing the brush high (or low, if for the lower teeth) upon the gums, and then rotating it so that the bristles pass over both the gums and the teeth. To cleanse the inner sides of the teeth the brush should be used in a similar manner; for the upper, place the ends of the bristles in the centre of the roof of the mouth, and roll it down over the gums and the teeth; for the lower, raise the tongue, and place the brush low down upon the gums. Then roll it over the ends of the teeth. The movements may be repeated several times, using plenty of water. The grinding surfaces are cleansed by the horizontal use of the brush, as is usually

practised for all surfaces of the teeth. The mouth should now be rinsed two or three times with tepid water.

One should use a brush of such a size that it may readily pass between the cheek and the most posterior tooth. The bristles should be of unequal length, and the head as well as the handle should be slightly curved. The whole brush should not be longer than five or six inches, and should not have a long tuft at the end. Beware of tooth pastes; a good powder is far better, because the pastes contain syrup, honey and saccharine, the very thing that causes tooth decay. Camphorated chalk is as good and cheap an article as can be procured. Beware also of the continued use of hydrogen peroxide. Dr. G. W. Cooke in his experiments has found that the continued use of H_2O_2 for one week will so lower the vitality of the tissue that it is susceptible to almost any disease. If you have a sick patient and you find that the hygiene of his mouth is not what it should be let him rinse his mouth with H_2O_2 , but stop there.

In cases of sickness when a patient is bed-ridden, the mouth should have special care. See that they are not swallowing slime and filth. If they should be wearing plates, see that they are scrubbed after each meal. This is easily accomplished by the use of a nail brush. Have them rinse the mouth before those plates are replaced. If the patient has no mechanical appliance in the mouth, see that he keeps his mouth clean if he is able. If not, do it for him with a brush. If you can't do that, use an atomizer, with an antiseptic, spraying out the crevices between the teeth, then swab off the tissues with sterilized cotton saturated with an antiseptic.

Prophylaxis by the dentist consists of the thorough sealing and polishing of every surface of every tooth with an orange-wood stick and pumice stone, massaging the gums, spraying the mouth and teeth, and instructing the patient in the proper care of the mouth and teeth. No one who has ever had a prophylactic treatment will ever be satisfied to go back to the old method of cleaning only the surface easily reached by the rubber cup and brush alone. Simply polishing the incisors and the surfaces that show is of little value to the patient except for esthetic reasons. The molars and bicuspids are of far greater importance so far as the health is concerned, as they do all the masticating.

Oral prophylaxis is of great importance to prospective mothers, who often suffer untold agony, because the dental phase of their condition is given so little attention both by the dentist and physician. Few people realize the great importance of dental service and advice before, during and following pregnancy. The old saying, "a tooth for a child," is not a true one, for that is unnecessary and avoidable. The nervous system is especially affected at this time. This has a tendency to make the patient fretful and peevish, careless and slovenly, and she totally disregards the hygienic laws she has previously observed with such great care. So the unclean

condition of the mouth and teeth, the excess of acid in the secretions, the highly nervous state, the vomiting of pregnancy, which coats the teeth with a mixture of partially digested food, and a solution of hydrochloric acid, are all great factors in causing dental caries and diseases of the soft tissues.

The method to pursue in this instance is to maintain as early as possible an hygienic condition of the oral cavity. Prophylactic treatment can be given once a month, without harm to the patient. The teeth should be brushed with a powder after each meal and before retiring. Dental floss should be used after brushing, a good antiseptic mouth wash should be used. The use of Phillips' Milk of Magnesia, or Formolid Magnesia, is also very beneficial. It should be used after each meal and before retiring for the night. The patient should rinse the mouth with it and take nothing into the mouth after its evacuation. This will neutralize the acid in the mouth and about the teeth. If this method is adopted mothers will experience little or no trouble with the teeth at the time.

Oral hygiene is just beginning to come into its own. The better physicians are recognizing its importance to the general health of the individual; the laity are awakening to the fact that unclean, unhealthy, immoral mouths are a menace to their welfare; and now all that remains to complete the initial steps in the successful propagation of this admirable propaganda among those still blind is for the mass of the dental and medical professions to learn, practice and teach the truths of oral hygiene.

That the time will ever come when disease shall be no more is but an iridescent dream, but that the time will come when much of the preventable disease of to-day will be as rare as is now Asiatic cholera, yellow fever and bubonic plague is a foregone conclusion. The dawn of that to-morrow already reddens the sky. The time is near at hand when the physician and dentist will resent being called medical or dental practitioners. Their motto will no longer be "I cure," but "I prevent."

ORAL HYGIENE.

A. E. WEBSTER, M.D., D.D.S., L.D.S., TORONTO.

Introduction to an Address delivered at Hamilton.

Mr. Chairman, Ladies and Gentlemen,—Every century and every decade changes our views as to what is really worth knowing. As a matter of fact these are not real changes, but merely other and more advanced views of the same question. Though there may be periods of retrogression, yet the history of the race is one of progress, from poor to better, from ignoble to noble, and from unworthy to worthy interpretations of life. On every hand there are evidences of human progress. Not the least among these

evidences is the unmistakable growth of knowledge concerning the human body, and the greater consideration for its welfare. The real man, however, is determined by his purposes and aspirations, and not by his physical prowess. "As man thinketh in his heart, so is he."

Races of men and individuals who have greatest physical energy, succeed beyond those of less vigor. As the individuals of a nation deteriorate, so does the nation. Then the greatest asset to any nation is its people. One would hardly think this were true, when one remembers that here in this Province there are hundreds of bulletins sent out by our Government on all manner of subjects, while there are only tens sent out on public health. If we were only flowers, forests or minerals, horses, sheep or pigs, apples, peaches or the black knot, we would lack no opportunity to know all about ourselves; but being mere men, women and children (the greatest asset of a nation), we must find out about ourselves by ourselves. We have not yet reached the stage in government when we will supply funds to prevent disease in man, with as free a hand as we supply funds to prevent disease in horses. In fact the Ontario Government conducts a college, to educate men to care for domestic animals, while they would falter at equipping and maintaining an institution to educate women to care for their children.

The time is coming when every nation will look upon the health, strength and beauty of its people with as much pride as the fond parent does her manly son or charming daughter. The British nation has already recognized the need of maintaining the physical well-being of its people, though it is for the purpose of killing others.

The army and navy have recognized that only those who are physically fit should be enlisted. They consider a man physically unfit who has not a good set of teeth. The regulations in this regard are so strict, that in many of the recruiting stations over half the candidates presenting have been rejected for this cause alone. Similar conditions will exist in Canada, unless more attention is given to this important subject.

PROGRESS IN CARE OF THE SICK.

At the present time the United States Government is considering the advisability of establishing a Department of Public Health. In Canada there has been established the Canadian Public Health Association, whose influence will be felt all over the land.

The State of New York through its Commission of Health, has appointed two dentists as public lecturers on oral hygiene. The municipality of Philadelphia has established a clinic for the care of the mouths of the poor of the city. The Departments of Agriculture and Education of Ontario, have each published pamphlets on this subject. The patients in the Provincial hos-

pitals are now receiving dental care it is admitted. No mouth with decaying, loose, pyorrhoeic teeth can be kept clean.

Philanthropists have in the past given of their means to the care of the sick, but little has been done to so instruct and educate people that they might avoid sickness. Dominion, Provincial and Municipal Boards of Health have done much to prevent others from bringing diseases to us, but little to help us to avoid diseases ourselves. Under a democratic system of government, it is necessary for the people to show those in authority that there is a real need for anything before it will be granted. It has been established that there is a real need for hospitals, both for those physically and mentally sick, and they are maintained. It must be established that there is a real need for preventing people from being sick at all, which is a far greater work than caring for those who *are* sick. It has been said, "Every sick man is a criminal," because he has disobeyed the laws of nature, but it might be more truthfully said that every criminal is a sick man. Why should we blame a man for being sick, if he has not been taught how to keep well?

I come before you to-night, to help in some measure to show how to keep from being sick, and to show that there is a real need for the measures which I advocate, and to do what I can to place before you some facts regarding the relationship existing between the conditions of the human mouth and general health. I am not one of those who believes that even a little bit of knowledge is a dangerous thing, or that there are any of the normal functions of the human body that we should not know all about. Every child should be taught as early as he can understand, all about the normal functions of the body. This should be done to protect him from indiscretion in many directions, and especially to protect him from the debasing literature of the charlatan and the quack. With this introduction, let us discuss freely what we know of the disease of the mouth and associated parts.

The first slide shows the anatomical relation of the mouth cavity to the nose, ears, throat, lungs and stomach.

Infectious diseases, which usually enter the body by the mouth or nose are:—Colds, measles, whooping cough, scarlet fever diphtheria, small pox, chicken pox, syphilis, rheumatism, pneumonia, antral trouble and tuberculosis.

From the close relation of all these cavities, it can be seen that whatever affects one is likely to affect one or more of the rest. If these cavities were always clean and healthy, there would be a resistance to the growth of infectious germs rather than an encouragement of their growth as occurs in a dirty mouth. Such diseases as measles, whooping cough, chicken pox, scarlet fever, diphtheria, pneumonia, rheumatism, tuberculosis and typhoid enter the body by way of the mouth or nose.

It is well-known that many of us have the germs of numerous infectious diseases in our mouths and throats almost all the time, and yet we do not have the disease. There is within every person resistive bodies, which when present prevent us from having diseases. But if for any reason we become exhausted and do not develop these anti-bodies and the organisms are present, we will contract the disease, or in other words, the disease germs begin to grow. It is our duty, then, at all times to so care for our bodies that they will at all times have a full store of these resistive bodies in our systems.

To begin with, these bodies are only abundantly developed when the system is working with full activity. If the food eaten is not converted into blood and tissue, normal health is not possible. If the food is not digested, it cannot be assimilated, and if it is not masticated, it cannot be digested. It cannot be masticated without good teeth. Thus if we would avoid infectious diseases, we must have good teeth to make possible good mastication, good digestion, good assimilation, and good health to develop the resistance.

Have these facts been demonstrated? Every dentist has recognized the improvement in health of his patients, whose power of mastication has been restored.

Case 1. Miss B., age 24, graduate nurse, June 10, 1907. Gradually lost weight and vigor for some years. Easily tired, constipated, nervous and sleepless, mouth fairly clean, little if any power of mastication. Quite a number of teeth present, but did not come together properly. Power of mastication restored by bridge-work. In three months she has gained 18 pounds in weight, and completely recovered from insomnia and other symptoms.

Mr. Gladstone's long and active life was attributed to his good teeth and careful mastication. It is said he recommended that each piece of food taken into the mouth should be bitten upon twenty times.

The latest advocate of thorough mastication as a cure for all ailments, is Horace Fletcher. By thorough mastication of his food he increased his weight over fifty pounds, and his physical strength and endurance by over a hundred per cent. Although he is a comparatively old man and has been an invalid for many years of his life, he has recently shown greater physical endurance than any of the young trained athletes of Harvard University. Dr. Fletcher is now devoting his time to lecturing on the value to health of thorough mastication of food.

Good teeth and good mastication are the chief factors in keeping the mouth clean. A clean mouth goes a long way to prevent disease.

Over fifty stereoptican slides were shown in connection with the address.

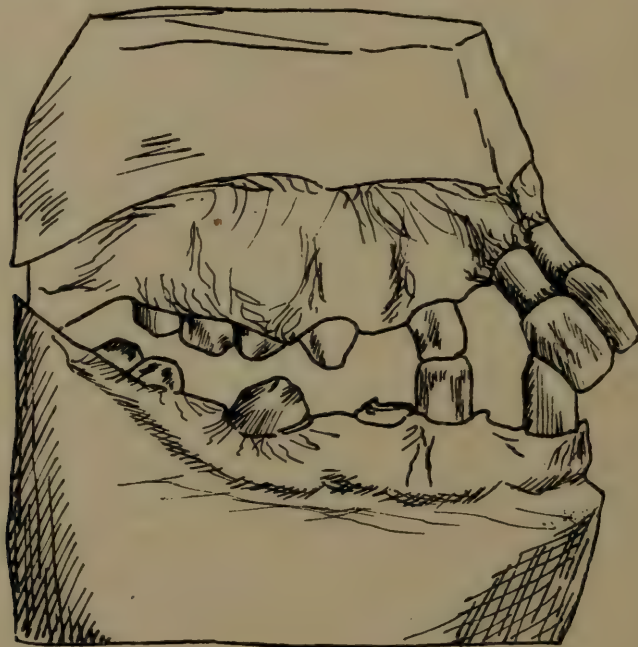
PYORRHEA ALVEOLARIS INFANTUM.

BY HOFZAHUARZT, TORGEN, DRESDEN.

Translated by Carl E. Klotz, L.D.S., St. Catharines, Ont.

In the case about to be described the effects of pyorrhea appeared with the eruption of the first deciduous teeth and accompanied the child through the whole period of first dentition, and then attacked the permanent teeth as they made their appearance, and eventually caused the loss of the teeth affected. From the diagnosis of the disease this is certainly a rare case, and from the description given by the parents the prognosis seemed hopeless, and in our literature an analogous case cannot be found.

From the parents I received a written statement about the little patient as follows: Erich Geiler, born April 24th, 1897. On the fourth day after birth we noticed that his hands and feet were chapped. The physician diagnosed it a case of psoriasis, otherwise



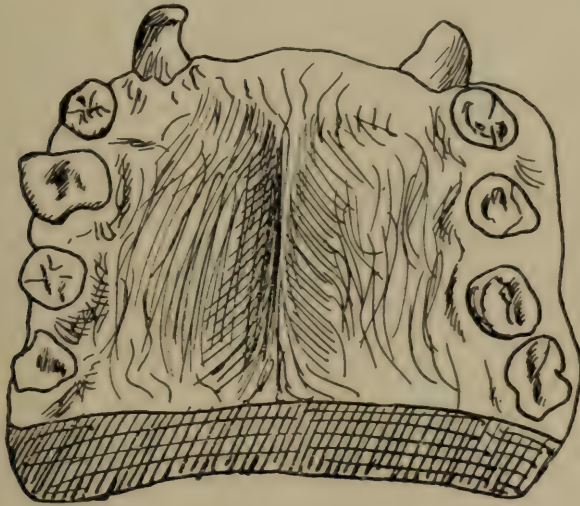
he found the child healthy. At thirteen months his first teeth made their appearance, but after two months the upper centrals, being in a very bad state, had to be extracted. From now on the eruption of the other teeth went the usual way and painless, but as soon as the teeth obtained their normal position they elongated and were forced out of their sockets until they finally dropped out.

At about eight years of age the first of his permanent teeth made their appearance, which shortly after their eruption began in the same way as with the deciduous teeth commencing with the centrals. The process continued for five years.

Sickness.—At about nine years of age the child had a severe attack of tonsilitis, and at five years he had the measles.

Thus for the report of the parents, to which may be added: Both parents are healthy and industrious, and their statement trustworthy. There is no tuberculosis in the family nor in any of their relatives. An only brother of the patient was a healthy child up to his twelfth year, but because of an illness for which he received wrong treatment, inflammation of the brain developed from which he died. There were no other children. The father is a steady, hard working and sober man. Parturition was normal, and the child well developed. The mother could not nurse the child, consequently was fed from bottle with diluted cows' milk, on which he thrived.

The eruption of the deciduous teeth commenced in the thirteenth month, and immediately after which the disease began with alarming symptoms. Gums and upper lip badly swollen. Through the extraction of a tooth there was a spontaneous exudation of pus. The eruption of the teeth was slow, and always ended in the loss of the tooth in a comparatively short time. The symptoms were not



so severe at first, the tooth became loose, elongated and the discharge of pus continued. The last of the deciduous teeth made their appearance in his fifth year and remained till the eleventh year.

The mother kept the teeth as they dropped out and brought them to me. They are fully developed, and the roots are remarkable for their length and strength and without a trace of resorption to be noticed. The child is rather undersized for his age, is delicate and pale. His nourishment might have been better; his complexion is of a grayish color, muscles flabby, chest measurement, inspiration 65 C.M., expiration 62 C.M. Skull formation pointed, facial bones strongly developed, particularly in the mandible.

At birth he had a scaly eruption on his hands and his feet. There is a dry, scabby, dirty, gray lupus on the palm of his hands, but without causing sores. He has not had medical treatment for it. The dental lesion was also neglected, presuming that nothing could be done for such an isolated case. The temperament of the child

was depressed, and in presence of the physician shy. He is conscious of his helpless condition. In school he is tormented and teased on account of his long teeth. Fig. 1.

There are twelve teeth in his maxilla, and the crowns of most of them are partly imbedded in the swollen gums. The centrals have been forced out of the alveolous almost to the apex of the roots; the laterals are abnormally separated from them, likewise the interproximal spaces up to the second molar are very large. There are only five teeth in the mandible, the incisors have dropped out, and the others have not made their appearance. The palatal arch is very flat, and the alveolar process is entirely wanting. The gums are loose, spongy, and form an eminence around the crowns of the teeth. The lower teeth slant lingually, and the upper are more inclined to a labial slant. In examining with a probe, on no tooth was the gum found attached to it, it was quite loose and could be pressed away from the tooth quite a distance, and formed deep pockets, with the teeth loose in their sockets. The gum bled profusely at the slightest touch; there was also a discharge of a white description. The articulation was certainly very defective.

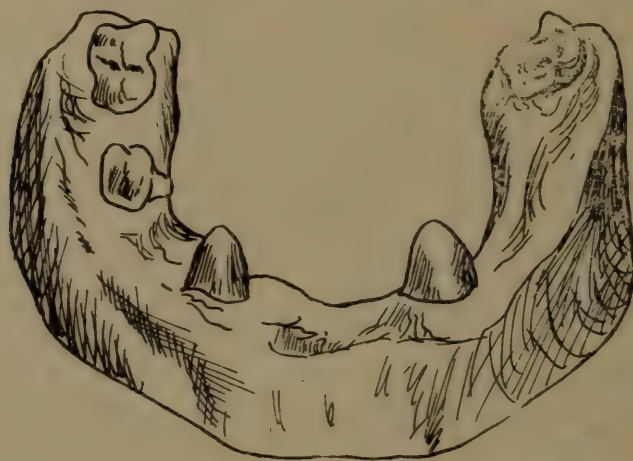


Fig. 1. Glandular trouble could not be found, and no disagreeable odor from the mouth.

Up to this time no attempt had been made to improve his denture. The present state could not be allowed to go on any longer.

The upper centrals were extracted, and a bridge, consisting of four incisors and two cuspids, for both upper and lower, and with the assistance of a suitable kind of a splint for the lower, I got a pretty fair articulation.

The favorable results of this arrangement could be noticed in a short time. He gained considerable in weight; his appearance was better; his temperament improved, and he became non-confident. A diet was prescribed, and a treatment of the skin of the whole body was undertaken with warm baths, swarthy, etc. Inwardly I prescribed cod liver oil with an addition of phosphorus, which agreed with him splendidly. The local symptoms in the oral cavity

I treated with pyocynase, apparently with good results. Nevertheless, I think that the malady will continue its course, probably somewhat slower. The anchor teeth for the bridges I am almost certain will, in time, loosen, and then the bridge will have to be extended. It is impossible to say how such a case will end.

CASTING IN DENTAL PROSTHESIS.

W. E. CUMMER, D.D.S., L.D.S., TORONTO, CAN.,

Professor Prosthetic Dentistry, R.C.D.S.

Casting in dental prosthesis is accomplished, generally speaking, along the same lines as that in operative dentistry and crown and bridge work, usually under pressure, with special modifications of details corresponding to, chiefly, greater bulk of castings, and also in some instances, to lower fusibility of metals, and in practically all cases using the disappearing wax model.

Thus in the casting of inlay, etc., we use compressed air centrifugal force, vacuum and steam or expansive vapor. In prosthesis all of these are used, as well as of simple gravity, as in the case of the use of a low fusing metal, usually for lower base plates.

Casting by means of compressed air is accomplished by an apparatus by which, immediately after the metal is melted in the depression of the investment formed by the sprue-former, a plunger

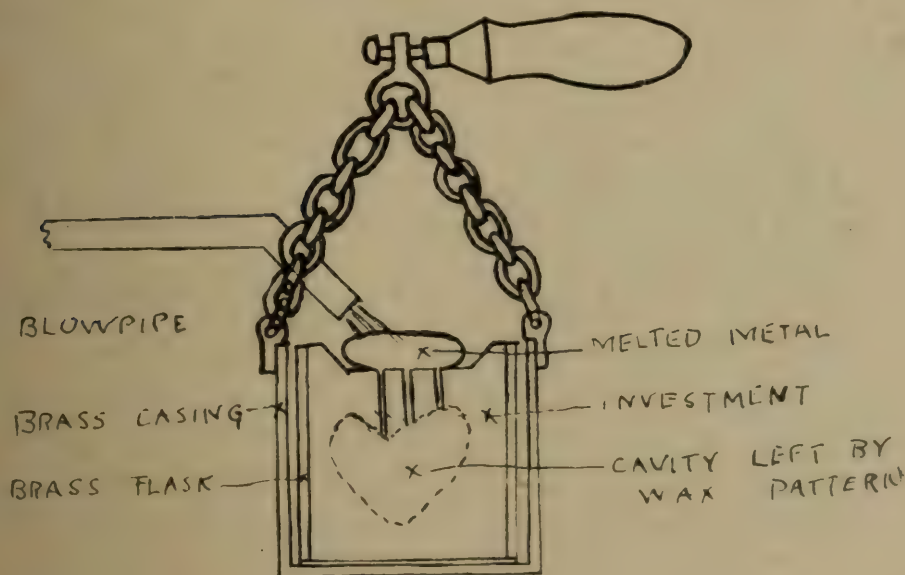


FIG. NO. 1—CROSS SECTION OF CENTRIFUGAL APPARATUS
READY TO SWING.

descends, enclosing it in a closed cavity, the only egress from which is into the mold; automatically compressed air is liberated, driving the molten metal into the mold. This system is fast becoming obso-

lete, although the pioneer method in dental casting, and, therefore, perhaps, deserves no further mention.

Casting by means of centrifugal force is accomplished, usually by means of a simple apparatus, in which the flask (similar to that used in the steam process, described at length further along), containing the invested wax pattern, is, after being tried and heated (at temp. 400 or 500 F.) ready for casting, dropped into a loose fitting casing which has a button, and which holds the flask during the casting, and which is connected by a chain to handle held in hand. The metal is melted in the depression formed by the sprue-former, and at time when the metal is thoroughly melted, the flask is rotated, by a swinging movement, around the freely moving joint at the handle, thus sending the molten metal into the mold by centrifugal force. Very fine results have been obtained by this method by Dr. Piper of London and Dr. Wilson of Cleveland. It has the advantage of simplicity and low cost of apparatus (may be altogether home-made), but requires a certain amount of experience and skill in making the rotatory movement, and in the case of a beginner, complicated with present-day small laboratory, liability to accident in flask meeting with obstruction and spilling the metal, is with its attendant dangers always present.

In the process of casting by means of a vacuum, a special apparatus is needed, the principal features of which are outlined below. A hollow chamber, usually of cast iron, in which a vacuum or exhausting pump is fitted, forms the basis of the apparatus. This chamber is fitted at one end with a vacuum gauge, reading in inches

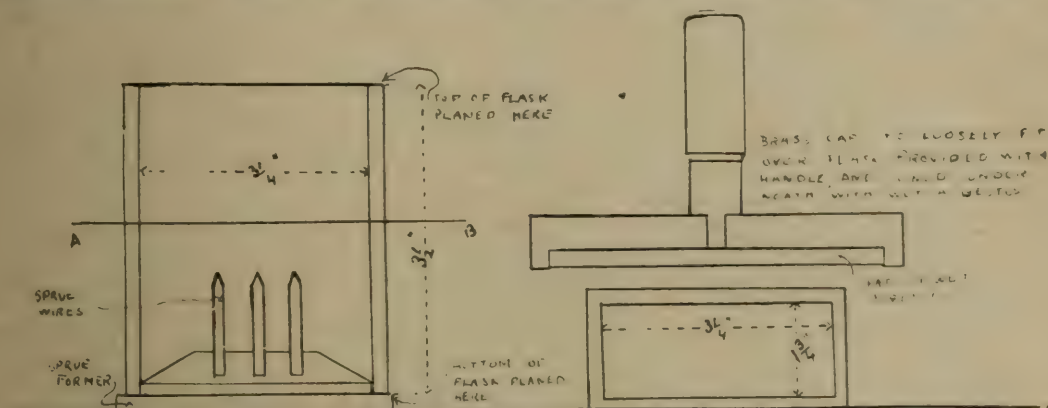


FIG. NO. 2—VACUUM CASTER.

of vacuum (the usual reading) and at the other end a special fitting, consisting of a flat, circular, accurately machined table, upon which are placed the flasks during the act of casting, and in the centre of which is found an opening connected with the vacuum chamber, governed by a ground cock, which is opened at the time

of casting. The wax pattern is invested in the flask in the usual way, wax burned out, and the whole case heated to about 400 F. The flask is then placed on the vacuum caster. Care must be taken to see that no dust or other obstruction interferes with the air-tight contact between the accurately machined bottom of the flask and the top of the table. The metal is melted in the depression formed by the sprue-former, a vacuum of about fifteen inches having been created ($7\frac{1}{2}$ lbs. pressure to sq. inch). The ground cock is opened and the metal is pressed into the rarified air in the mold by the disturbance of the balance with the atmospheric pressure, instantly filling it. Splendid results are daily secured by this method by many practitioners in casting prosthetic pieces. The advantages are comparative simplicity, but in order to successfully cast with the vacuum apparatus the technique must be careful and accurate. The chief cause of failure, aside from the use of a too dense investment, is a leakage of air between the bottom of the flask and the top of the table, thus interfering with the pressure on the metal. It might be said that a new vacuum apparatus has just been introduced, using an accurately threaded union at this point instead of mere contact, an improvement which, in the opinion of the writer, ought to reduce the failure to nil.

In the mind of the writer, however, the common principle of utilizing the steam generated from a moistened surface of asbestos brought over the flask to drive the metal into the mold is the simplest both in technique and apparatus, process for prosthetic casting, as well as thoroughly reliable. The necessary apparatus is made up of the following component parts: A box-shaped flask, open at each end, and planed at each open end, measuring about $1\frac{3}{4}$ in. x $3\frac{1}{4}$ in. x $3\frac{1}{2}$ in. inside; a loose fitting flat square brass cap, lined with asbestos on the bottom, and fitted with a handle, also a sprue-former, with wire sprues running into its upper surface.



Cross Section, Sprue Former and Cross Section Flask at A. B. Flask.

FIG. NO. 3—HAND STEAM CASTING OUTFIT.

Here follows a detailed description of technique followed by writer in the use of this system in making full upper metal base plates,

this being the frequent prosthetic casting, perhaps, made in the dental laboratory.

IMPRESSION.

Of convenience the impression is built out distally in the median line in order to provide a portion of the model upon which the sprue wires may be attached. The wings of the lower impression

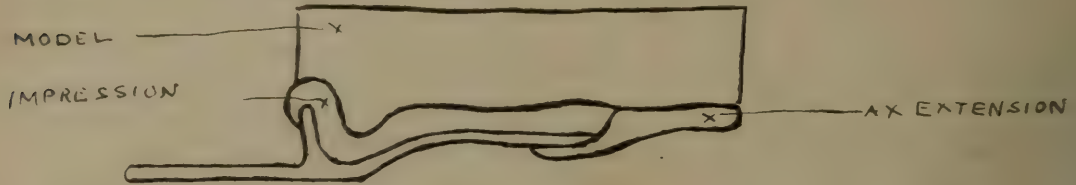


FIG. NO. 4—SHOWING WAX EXTENSION ON IMPRESSION GIVING ADDITIONAL LENGTH FOR ATTACHMENT. SEE FIG. NO. 6.

are joined by sheet wax, allowing a model in which the ridges are joined together, also a convenience in attaching sprue wires to wax.

COMPENSATION FOR HARD AND SOFT AREAS.

The impression of the upper mouth should always be taken, under as much pressure as is possible. In cases in which further compensation is required, the hard areas in the mouth must be scraped away on the impression, and the areas of least density either built up on the impression or scraped away on the model.

MODEL.

Any of the well-known investment materials seem to answer well for use as a model upon which to cast the metal. In aluminum work the writer has secured very good results from that humble, unvaunted mixture, equal parts of plaster and clean beach sand. As a rule it should be well jarred down into the impression, thus forcing the smaller particles of the sand and plaster to the surface of the impression, giving a smoother model and consequently smoother casting.

WAXING.

After correct outline has been secured, and marked on model in lead pencil, the model is covered with base plate wax, full thickness for pure aluminum, thinner for aluminum alloy, extra thin (about



FIG. NO. 5—WAX PATTERN ON MODEL.

23 gauge) for gold, and trimmed to this mark. It is a wise precau-

tion at this point, after rounding off the sharp edges, by passing rapidly over the flame, to chill the wax (always use hard wax), and try in the mouth, and see that the outline and compensation are both correct, then cut with a long-bladed knife, about a couple of strips of wax about 2 mm. wide and apply to the point of the margin of the vulcanite attachment in the upper, and all round the periphery in the lower beveling on the lingual side of the upper (Fig No. 5) with small wax candles for retention, the case is ready for mounting and investment. Before mounting, however, take the hot spatula and seal the edges of the wax up tight against the model.

MOUNTING.

This is the stage at which difficulty occurs, in mounting a heavy model, cover with wax, on small sprue wires in such a way that it will not jar or shake off during investment. On the upper model, upon the extension built out (mentioned under the head of Impression) a hole is drilled about 3 mm. clean through the model, at a point about 10 mm. back of the distal margin in the median line. This is filled with wax and the back of the trial plate at the distal in the median line extended by a piece of wax about 15 mm. x 15 mm. to cover this. A small piece is also laid on the under side

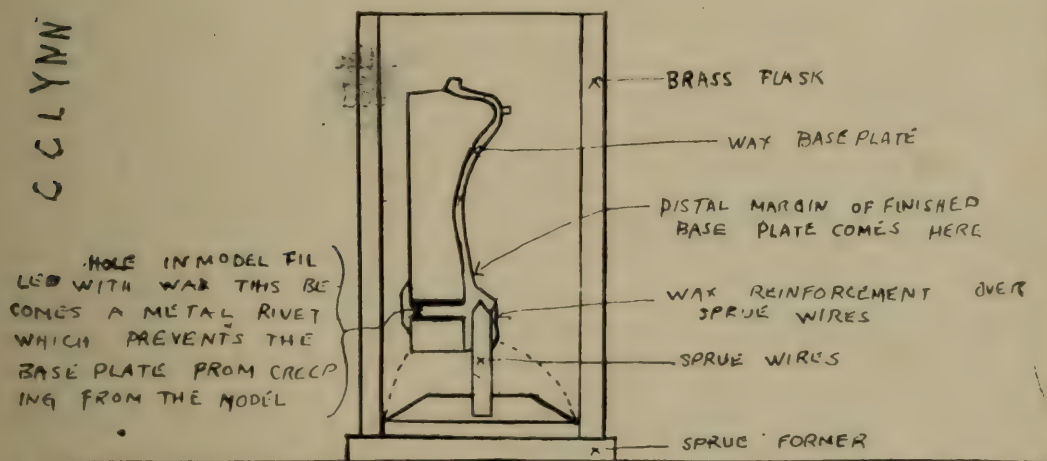


FIG. NO. 6—SHOWING CROSS SECTION FULL UPPER BASE PLATE MOUNTED READY TO INVEST. DOTTED LINE SHOWING FIRST INVESTMENT IF OPERATOR DESIRES TO ABSOLUTELY GUARD AGAINST MODEL BREAKING AWAY FROM SPRUE WIRE DURING INVESTMENT.

over the hole filled with wax. This procedure mechanically fastens the wax to the model, and the balance consists in mounting the three sprue wires on the sprue-former, heating them and melting these into the wax and reinforcing the wires with additional wax. Fig. No. 6 shows cross section of an upper, ready to invest. Loweres are mounted similarly, only the hole drilled in the investment on the surface between the ridges on the model, and the wax over the hole

joined to the wax pattern on the model by three strips about 6 mm. wide, which disappear to form gates for the metal.

INVESTING.

Previous to investing the mounted model, wax, etc., should be well moistened, facilitating the union of the investment with the model. Investment is then mixed, thin enough to pour readily, and any detail rapidly painted in with the thin investment, with a camel hair brush. The flask is placed on the sprue-former, and the balance of the investment run in down one side with one hand, jarring down with the other, until filled.

REMOVING WAX.

This should be done almost immediately after the investment sets, slowly at first, until molten wax ceased to come away, then a little more flame until all vapor ceases to come from the investment, at which time it is ready to cast. An occasional crack in investment need occasion no alarm, as it furnishes an easier egress for the air displaced by the metal, and being in the investment the film of metal which may fill it will not occur on the necessarily accurate part, by the maxillary surface.

CASTING.

The flask is placed on the bench on a sheet of asbestos, and a sheet of asbestos about 2 in. x 4 in. laid on the top of the flask, and bent in crucible form. The metal is placed on this and melted, preferably with a blowpipe mounted on a stand, leaving both hands free. When the metal is melted this sheet of asbestos is withdrawn, carrying away any oxide, and allowing the molten mass to drop into the depression made by the sprue-former. The cap with the moistened asbestos is then placed over the flask and brought down square with considerable pressure, in order to insure a tight joint and no leakage of steam. A pressure of about 15 lbs. sq. inch is instantly generated and the metal is forced into every part of the mold.

REMOVING.

After the metal has solidified the flask may be placed in cold water until ebullition ceases. The investment and casting may then be very easily removed with a heavy carpenter's key-hole saw, inserted in one corner and run around the inside surface of the flask. The case may then be trimmed, tried in the mouth, and the steps of taking the bite proceeded with, finishing after or before vulcanization.

In conclusion a brief comparison of the relative advantages and disadvantages of casting and swaging may be of interest. Swaged metal bases consume more time, but, bulk for bulk, possess greater strength and density than the cast, also the decided advantage of ease in changing the compensation by returning to the model and

reswaging with either a thin metal slip for the hard spat or scraping the model for the soft, which is impossible with the cast. On the other hand the cast, while bulkier, has a more hygienic joint between vulcanite and metal, makes a neater finished case, has per-

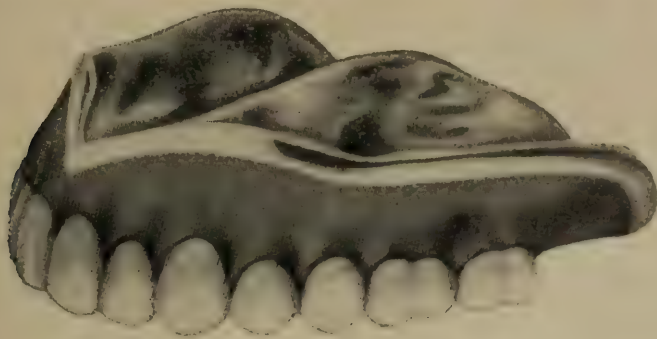


FIG. NO. 7—FINISHED PIECE.

haps a little better adhesion due to the slight granular finish to its maxillary surface adhering to the saliva and mucous membrane a little better, and last, but not least, a great time and labor saver.

Dr. F. Buchanan of Galt, Ont., is now practising in Moose Jaw, Sask.

Dr. Allan W. MacGregor of Arnprior, Ont., has returned from a trip to the Pacific Coast and has decided to locate in Vancouver.

FOR SALE.—Dental practice in Prescott, Ontario. This office is well equipped, has an excellent location, and presents a good opening for a bright young man. Two other dentists in the town. Apply to J. C. Carruthers, Prescott, Ontario.

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**Ontario Dental Society Meets in Toronto
May 31, June 1 and 2, 1911**

Dominion Dental Journal

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VOL. XXIII

TORONTO, APRIL 15, 1911

No. 4

REVISED DENTAL ACT FOR ONTARIO.

This is not a revision suggested or introduced by the Dental Profession or the Board. It is part of the work of the Commission to revise the Ontario Statutes. Its Chairman is the Chief Justice, Sir William Meredith.

During the past two years there have been two or three cases in the courts of Ontario which had as their object to prevent the Board from using its disciplinary powers in respect of licentiates who violated the by-laws. In every case the Board has won, but the case has been appealed again and again. The Court of Appeal handed down its last judgment a few weeks ago. It is said the case is to be carried to the Supreme Court of Canada. This is unlikely, however. The revised Act, as quoted below, provides in the Act and leaves no doubt about the disciplinary power of the

Board what was but a by-law under the old Act. It places it beyond any doubt that the Board can cancel a license, and that persons not licentiates cannot own or conduct a dental practise.

Only the new and revised sections are quoted below. It might be remarked that the choice of the short title might better have read, "The Dental Act" instead of "The Dentistry Act." This expression reminds one of the expression, "Are you dentisting in Cobourg now?"

1. This Act may be cited as The Dentistry Act. *New.*

3. (1) The College may purchase, take and possess for the purposes of the College, but for no other purpose, and after acquiring the same, may sell, mortgage, lease or dispose of any real estate. *New.*

10. There shall be paid to each member of the Board such fees for attendances, as shall be fixed by law, not exceeding \$20 per day, and such reasonable travelling expenses as may be allowed by the Board. R.S.O. 1897, c. 178, s. 9.

PENALTY FOR PRACTISING WITHOUT LICENSE.

25. (1) No person who is not a member of the College shall by himself or by any other person practise the profession of Dental Surgery, or perform any dental operation upon, or prescribe any dental treatment for any person, for hire, gain or hope of reward, whether by way of fees, salary, rent, percentage of receipts or in any other form, or shall pretend to hold, or take or use any name, title, addition or description implying that he holds a certificate of license to practise Dental Surgery, or that he is a member of the College, or shall falsely represent, or use any title representing that he is a graduate of any Dental College.

(2) Every person who contravenes any of the provisions of this section shall; for the first offence, incur a penalty not exceeding \$50, and for every subsequent offence a penalty not exceeding \$100, and he shall not be entitled to sue or recover in any Court for any services which he performed, or materials which he provided, in the ordinary and customary work of a dental surgeon.

(3) This section shall not prevent any duly articulated student of Dental Surgery from receiving instruction in clinics and practice under the personal supervision of a member of the College. R.S.O. 1897, c. 178, ss. 26 and 32. *Amended.*

(4) The penalties shall be recoverable under *The Ontario Summary Convictions Act* and shall be paid over by the convicting

justice to the Treasurer of the College. R.S.O. 1897, c. 178, s. 27.

26. In any prosecution under this Act, the burden of proof that the defendant is entitled to practice the profession of Dental Surgery, or to use the title assumed by him, or that he is a graduate of the Dental College of which he professes to be a graduate, shall be upon him. R.S.O. 1897, c. 178, s. 31.

SUSPENSION OR CANCELLATION OF CERTIFICATE.

27. (1) The Board may suspend or cancel the certificate of License of a member of the College who has been heretofore or shall hereafter be convicted in Canada or elsewhere of an indictable offence if his conviction remains unreversed, or who has been or shall be guilty of any infamous, disgraceful or improper conduct in a professional respect, but this power shall not be exercised if the conviction is for a political offence committed out of His Majesty's Dominions, or for an offence which, though indictable, ought not, either from its nature or from the circumstances under which it was committed, to disqualify the person convicted from practising dentistry.

(2) Where a member has been guilty of infamous, disgraceful or improper conduct in a professional respect the power conferred by subsection 1 may be exercised notwithstanding that he has been acquitted of a criminal charge in respect of the same matter.

(3) The Board may of its own motion, and upon the application of any four members of the College shall, cause inquiry to be made into any case in which it is alleged that a member of the College has become liable to the suspension or cancellation of his certificate of license for any of the causes mentioned in subsection 1.

(4) The Board shall appoint and shall always maintain a Committee of its own body for the purpose of ascertaining the facts of each case which may become the subject of inquiry.

(5) The Committee shall consist of such number of members, not less than three or more than five, as the Board may prescribe, three of whom shall be a quorum.

(6) Subject to the provisions of this section and of the by-laws of the Board, the Committee may regulate the time and place for the holding, the manner of the convening and giving notice, and the conduct of its meetings.

(8) If a vacancy occurs in the membership of the Committee the remaining members may appoint a member of the Board.

Council to fill the vacancy, and the member appointed shall hold office until the next meeting of the Board.

(9) Notwithstanding any vacancy in the Committee, so long as there are at least three members thereof, it shall be competent for the Committee to exercise all or any of its powers.

(10) The Committee may employ, at the expense of the Board, for the purpose of any inquiry, such legal or other assistance as the Committee may deem necessary.

(11) The member whose conduct is the subject of inquiry shall have the right to be represented by counsel.

(12) All meetings of the Committee for taking evidence or otherwise ascertaining the facts shall be held within the county or district in which the member whose conduct is the subject of inquiry resides.

(13) At least fourteen days' notice of the meeting of the Committee for taking the evidence or otherwise ascertaining the facts shall be given to the member whose conduct is the subject of inquiry.

(14) The notice shall contain a statement of the matter which is to form the subject of the inquiry.

(15) The testimony of the witnesses shall be taken under oath, which the Chairman or any member of the Committee may administer, and there shall be full right to cross-examine all witnesses called and to adduce evidence in defence and in reply.

(16) If the person whose conduct is the subject of the inquiry though duly notified does not attend, the Committee may proceed in his absence, and he shall not be entitled to notice of the future meetings or proceedings of the Committee.

(17) The Committee and any party to the proceedings may obtain on *praccipe* from the High Court a subpoena for the attendance of witnesses and the production of books, documents and things, and disobedience thereof shall be deemed a contempt of Court.

(18) Witnesses shall be entitled to the like allowances as witnesses attending upon the trial of an action in the High Court.

(19) The Committee shall report to the Board the evidence adduced and the Committee's findings thereon.

(20) The Board may act upon the report of the Committee and may make such order thereon as the Board may deem just.

(21) Where the complaint is found to be frivolous or vexatious.

the Board may pay such costs as to it may seem just to a member whose conduct has been the subject of inquiry.

(22) Where the Board directs the certificate of license of a member to be suspended or cancelled, it may direct that the costs of and incidental to the inquiry be paid by such member, and after taxation of such costs by one of the taxing officers of Toronto, execution may issue out of the High Court for the recovery thereof in like manner as upon a judgment in an action in that Court. *New.*

28. No action shall be brought against the Board or the Committee or any member thereof for anything done in good faith under this Act on account of any want of form or irregularity in their proceedings, but a member whose certificate of license has been suspended or cancelled may at any time within six months from the date of the decision of the Board appeal from the decision of the Board to a Divisional Court of the High Court. *New.*

29. The practice and procedure upon and in relation to an appeal shall be similar to that provided by *The County Courts Act* as to appeals from the County Court except that the appeal shall be set down for argument at the first sittings of a Divisional Court which commences after the expiration of six months from the date of the decision complained of, and except that the proceedings and evidence shall be certified by the Registrar to the High Court. *New.*

30. The Board may direct the restoration of the certificate of license of any member whose certificate has been cancelled under the powers conferred by this Act, upon such terms and conditions as the Board may deem just. *New.*

31. Nothing in this Act shall affect or interfere with the rights and privileges conferred upon legally qualified medical practitioners by *The Ontario Medical Act*. R.S.O. 1897, c. 178, s. 33.

32. Chapter 178 of the Revised Statutes of Ontario, 1897, is repealed.

Editorial Notes

Dr. Stewart McLean Milne and Mrs. Jencie Virginia McDonnell announce their marriage on Monday, March 20th, 1911, at Seattle, Washington.

E. J. McCormick Rubber Company, beg to announce the removal of their office from 26 West Broadway to 113-117 West 31st Street, New York City.

Dr. Henderson announces the removal of his office to the Kent Building, corner of Richmond and Yonge Streets, Toronto. Phone Main 3490. Extraction of teeth.

Dr. W. H. Doherty, Dental Inspector of the Public Schools, Toronto, has completed a course of lectures on the mouth and teeth to the nurses and medical inspectors.

The Canadian Century continues its articles on the care of children's teeth by Dr. Cuthbertson, Brantford. Many of the papers of Canada are publishing excerpts from these articles.

Lloyd George, the Chancellor of the Exchequer, has declined to allow dentists the liberty of running their automobiles as high a speed as physicians. It was claimed that pain from toothache was not a matter of life and death or suffering.

In filling a root, utilize gravity. If an upper root, tilt chair and headrest until apex of root is lower than crown. Air will be expelled and liquid introduced to the apex as it will not be with gravity against the operation.

That a man may know his own language well, educators find it necessary to teach him one or more other languages. A fortiori if a man is to know operative dentistry well, he must learn much outside of that subject. Physical knowledge of almost all sorts is useful to the dentist. The

more he has the better service he is able to render.

The Legislature of Manitoba gave Dr. Robinson, of Saskatchewan, a private bill permitting him to set for the Manitoba Dental Board examinations without the matriculation standing. It was claimed that Dr. Robinson was twelve years in practice. If this were true and he was ethical all that was needed was to present his qualifications to the Secretary of the D.D. C., and a certificate would be issued which would be accepted in Manitoba without any further examination, either preliminary or professional.

The law suit instituted by Bert Cummings Richards D.D.S., against the B. C. Dental Council, which has aroused considerable interest in the dental profession throughout the Dominion, has been settled in favor of the Council, by a decision handed down by Justice Gregory, of Victoria, B. C.

The text of the judgment was, that when the plaintiffs side of the case was concluded the Council's innocence was proven.

The action was dismissed with costs against the plaintiff.

The case in question arose owing to the failure of Richards to pass the required examination as set by the Council.

The allegations of the plaintiff were, that the Council by fraud and conspiracy prevented him from obtaining a license.

Expert testimony was called in an attempt to prove that the Council did not mark fairly. This was disproved without question.

Experts engaged for Richards were Dr. Jordan, of Seattle, Dr. Bapty, of Victoria, and others.

Dr. Robert J. Read, of Toronto, Ont., acted in an advisory capacity, also as an expert on behalf of the Council.

Proceedings of Dental Societies

TRANSACTIONS OF THE TWENTIETH ANNUAL CONVENTION OF DENTAL ASSOCIATION OF THE PROVINCE OF NOVA SCOTIA.

Dalhousie University, Halifax,
July 14th, 1910.

The Twentieth Annual Convention of the Nova Scotia Dental Association was opened at 10.30 a.m. by Dr. V. F. Cunningham, of Sydney, President.

A motion was adopted to the effect that the minutes be received as read.

PRESIDENT'S ADDRESS.

Gentlemen of the

Nova Scotia Dental Association.

I deem it an honor to have the privilege as President of the Nova Scotia Dental Association, of opening this our twentieth annual Convention. It is a pleasure to welcome all, and I trust our assemblage here will prove profitable from an economic and professional standpoint, and beneficial from a social one.

The proud position that our profession holds to-day imposes upon us obligations that we must recognize and realize. We must meet these obligations and fulfil them. We know what they are and it remains for me simply to say that we must do our full duty. Every member of the profession in Nova Scotia should be an active member of this association and should be fully alive to the great influence of such an organization. I trust, then, that our two-days' session will be productive of much good and inspire every man present to reach and maintain a high personal and professional standard, and to strive to elevate the standing of the profession in general.

The Maritime Dental College established in this city some two years ago, is a flourishing institution, and is taking an enviable position among the schools of the country. It deserves the fullest support of each and every one of us, and will only progress in proportion to the interest we take in it.

There are two things that we ourselves and our students should strive for, and they are the deepest and widest possible

knowledge of our profession, and strong manly character.

The Canadian Dental Association met in Toronto in early June and it was then resolved, among other things, to ask the Dominion Government to appoint dental inspectors to the public schools. During the past two years a voluntary inspection of school children's teeth was made in the city of Halifax and Sydney, and it was found from seventy-five to eighty-five per cent. of the children were suffering from defective neglected and ill-kept mouths, so many other ills follow, particularly throat and teeth. Now when we consider that from intestinal troubles, it seems to me that an annual inspection of the mouths of school children is a necessity. And I suggest that before we dissolve this meeting this matter of dental inspection be considered and an offer of help in securing the passage of suitable legislation be made to the Canadian Dental Association. Much good work is being done by the Canadian Oral Prophylactic Association of Toronto in publishing literature on the care of the teeth.

Two years ago our President spoke earnestly and distributing among the public dental advertiser in this Province and urged the serious consideration, in the convention, of "Ways and means to check the growing evil." I regret to have to say that the evil has still been growing and spreading during the past two or three years. "Get practice at any cost and by every method, but get it" is the motto of the advertiser. The advertisers are lowering our standard and working incalculable harm. I repeat the request of our former President and ask you again to consider this question of the advertiser at this convention.

In conclusion, gentlemen, let me ask you to listen carefully to the different papers that are to be read and to attend the various clinics.

V. F. Cunningham, President.

Dominion Dental Journal

VOL. XXIII

TORONTO, MAY 15, 1911.

No. 5

Original Communications

DENTAL LEGISLATION IN GREAT BRITAIN.

J. W. MEADOWS, D.D.S., L.D.S., LONDON, ENGLAND.

It is almost impossible, in a necessarily short article, to give any clear idea of the chaotic state of dental legislation in Great Britain at the present time, and the writer ventures with a great deal of diffidence to give the readers of the DENTAL JOURNAL some faint idea of how things stand with the profession in the Old Country. To understand the present situation it is necessary to review the work of the British Dental Association in fighting unregistered practice since 1878. Prior to that date dentistry was a vocation practised by anyone, educated and uneducated alike, on an equal footing, with no line of demarcation between one class and another. The desire of the then conscientious dentist to be classed among the professions led to the passing of the Dentists Act of 1878. The Act clearly intended the prohibition of unqualified practice and the offering of inducements other than good work which alone should claim special qualification. A "Register of persons specially qualified to practise as dentists in the United Kingdom" was instituted, and all who on "declaration" proved themselves to be in bona-fide practice were placed on the Register. This Register was given into the hands of the General Medical Council, in whom also by the Act was vested disciplinary powers over those thus registered. From a comparatively few who were at that time placed on the Register, the number of unqualified men and their assistants has grown to upwards of 50,000. When one takes into consideration that the most of these men are quite uneducated, and that their "stock-in-trade" consists of a few sets of forceps and a gas bag, and that their avowed intentions—as their association name implies—"Extractors and Adaptors"—merely to pull out teeth, good and bad, the more the better, and replace them by artificial ones, we in Canada are astonished that such a state of affairs could exist. As it is the profession is in a worse state than

before the passing of the Act. Having some curiosity as to what these places looked like from the inside, and having also a desire to extend my knowledge, I visited several. One house backed up against another in which a friend of mine had his surgery. All day one could hear the noise of the gas bag going merrily. I went in as a prospective patient. There were two operating rooms. The "dentist" was at the moment in the other, and I took the opportunity of looking around. A chair, a bracket, and a gas apparatus—of instruments there were none except a few universal forceps, and those were rusty and dirty; also a few excavators with their points broken, and a pair of old tweezers. Another place of long standing and well known in London, although covered from roof to pavement with signs—"Painless Extractions," "American Dentistry," "Full Set One Guinea," etc., etc., was much better fitted up inside. This place makes much of the recommendations of grateful customers, one in particular being a well-known M.P. I visited this place and was introduced to the manager. I told him that I was an American dentist. "You want a place I suppose? Well, we're always wanting men. What can you do?" "Gold, porcelain work, regulating, etc.," I answered. "Yes, but can you pull teeth?" "Yes, when it is necessary," I said. "Well, you would soon learn that," he replied. "But there is one fault I always find with you Americans—you can't take fees." I protested. "Yes, that's all very well to have a fixed charge, but how could I make it pay if I always put in a set for one guinea, or one tooth for two and six? No, you must say that it's impossible to make them a guinea set, that their mouth is very difficult to fit, etc., etc. Also, if they want one tooth out, you must manage to get out some more; one cannot make a plate for one tooth." He made me an offer. I told him that I would think it over. I heard another man say that when his customers wanted a guinea set he gave them a basketful of second-hand ones and told them to take their pick. Of course there are a number of unregistered men who have formerly been dental mechanics who do good work, but their number is few.

Great hopes had been held that the Dentists Act would prohibit unqualified practice; but those hopes are now dead. Now, we know that the Act can do no more than prohibit the use of the title Dentist or Surgeon Dentist. In the past few years the British Dental Association has constantly brought the Act into use and convictions have been obtained against unregistered persons for the use of such titles as "Dentist," "Dentorium," "D.D.S.," "Teeth Specialist," and other variations. But in different parts of the country magistrates held different opinions, the result being an absolute muddle; judgments alternating pro and con, but on the whole in favor of the B. D. A., until the most of the profession were dispirited by the monotony. Thus was the Act interpreted by individual magistrates throughout the country, except the case of *Emslie v. Peterson* in the Justiciary Court of Appeal of Scotland, in respect to the words "American Dentistry" and "Dental

Office." Here the judges held that, although the words indicated that dental operations were performed, yet such operations were in themselves not illegal, and the appellant did not thus seek to convey that he was registered or specially qualified. A further complication was caused by the Irish Court, King's Bench Division (*O. Duffy v. Jaffe*), decision that the word "person" in the Dentists Act relates only to an individual and does not thereby mean a company or corporation, and that therefore a company is not liable to the terms of the Act. But, according to the English Court of King's Bench (1904, *Panhaus v. Brown*), if an unqualified person makes use of a company formed and controlled by himself he thus makes himself liable to conviction under the Dentists Act. In reference to the registration of companies, the Irish Court, King's Bench Division, *Rowell v. the Registrar of Joint Stock Companies*, refused to compel, by mandamus, the Registrar to register the memorandum of association of a joint stock company formed for the purpose of doing business as "teeth extracting and artificial teeth making" when the memorandum provided that the company's name should be "S. G. Rowell, Dentist, Limited"; none of the signatories to the memorandum having been registered as a dentist under the Act of 1878. Registrars of Joint Stock Companies for England, Ireland and Scotland were informed by the Privy Council that if the title of any company contains the word "dentist" or any expression calculated to mislead the public into supposing that the company is specially qualified to practise dentistry, then the registration should be refused, even if one or more of the signatories are qualified dentists. On the other hand, registration may be allowed if the name is not misleading to the public. A number of cases have been fought out on these lines, with more or less success, against companies whose name did not include the word "dentist," but whose business under the wording of the memorandum was to carry on the "practice of dentistry." These companies are usually one-man companies, the rest being "dummies." Usually the working capital is about nothing. In most cases the sum of £10 covers the cash payment for shares, although there has been a considerable nominal capital issued. In one case only was there found a considerable number of shareholders; but also in this case, although the nominal capital was £100,000, of which £92,174 had been issued, only £4,124 had been paid for in cash.

A case was tried in the Liskeard Police Court, "Mr. W. Shearwood, Painless Extractions," and was lost. Then another in the Metropolitan Area, the case of Barnes, "High-Class English and American Teeth. Painless Extractions." In this case the magistrates agreed that the name implied competence, and consequently "special qualification to practice." Barnes was convicted and appealed; but the conviction was upheld. The greatest importance was attached to this conviction, as it was considered to be binding on all minor courts of the Kingdom—the House of Lords alone

being excepted, it being the highest court of appeal. Before this case there had been a lack of uniformity of judgments upon matters submitted to Police Court jurisdiction owing to the want of a binding precedent. The Lord Chief Justice of England, with Mr. Justice Walton and Mr. Justice Bingham, concurred in opinion that the words of the Act, "specially qualified," were to be interpreted in the "popular sense." The general opinion after this conviction was that it was illegal for any unregistered man to indicate in any manner whatsoever (for example, Painless Extractions, Advice Free, Crown and Bridge Work) that he carried on the practice of dentistry. The long fight between the British Dental Association and the unregistered man was thought to have ended. The B. D. A. issued a warning to all persons acting in contravention to the Dentists Act. But these persons did not consider themselves beaten. They had numbers, money, and evidently brains. A case was got amongst themselves, a test case, and evidently engineered by some astute lawyer. This was the case of Bellerby v. Heyworth & Bowen. A partnership was formed between three persons and specified to carry on the practice of dentistry. The partnership could be determined by any one or two if any one of them did anything in contravention to the Dentists Act. One put up a sign with wording similar to that in the case of Barnes, which had been declared illegal. The others gave him notice. He went to the Court of Chancery to restrain the others from winding up. The judge dismissed the application, saying he was bound by the Barnes case. Then Bellerby went to the Court of Appeal, which decided in his favor. Then the case was taken to the House of Lords, which endorsed the decision of the Court of Appeal. This decision finally demonstrated that the Dentists Act of 1878 prohibits the use of the title only by unqualified persons. The number of dental quacks is increasing rapidly. New places are being opened almost daily. The general public, which cannot distinguish between the qualified and the unqualified man, is exposed to grave risks, and the danger can only be dealt with by fresh legislation. To improve this deplorable state of things, legislation must be introduced by the Government. A draft bill to prohibit practice by the unqualified, drawn by a representative board, in terms according to the resolutions of the Birmingham meeting in 1909, and presented to the general meeting held at Liverpool in 1910, is now under consideration. "In this bill there is no question of admitting the unqualified to the Register or to a register. They can obtain a certificate of exemption from prosecution and a receipt for a tax" providing that they can prove to have been in bona-fide practice for a term not less than five years before the passing of the Act. Thus we can safely say that there will be 50,000 unqualified persons, who will still continue to "extract and adapt," and who will still continue to sing "Have them all out and I'll make you a nice little plate."

DEVITALIZATION OF TEETH--RECURRENT ABSCESSES AND THEIR ACCESSORY DISEASES.

BY DR. STANLEY BURNS, MONTREAL.

Read before the Ottawa Dental Society, March 17, 1911.

Correct diagnosis is all-important in relation to diseases affecting the teeth.

The old adage stands good in dentistry as in all others, "Be sure you are right, then go ahead."

Dr. Buckley, in the February *Dental Cosmos*, lays great stress on diagnosis, and while it is, as I said, all-important, yet the fact of the cause being arterial or venous congestion seems to me rather more minute than the average dentist would care to place much dependence on.

Always obtain as nearly as possible the correct history of the case—always discuss the case in your own mind while questioning the patient as to the condition inducing pain—cold and heat, both by application as in taking hot tea or cold water, coming from outside into house or vice versa—chills—aching after meals, aching between midnight and early morning hours—what remedies applied and how they acted—conditions over tooth and gum. If patient is not sure of tooth troubling test with hot and cold syringing, endeavoring to locate definitely the troublesome tooth.

If this is not satisfactory locate definitely by means of exploring instrument.

Many cases of mechanical injury, such as soreness from a blow, death of the nerve may be averted by means of the suction-cup plaster applied over the gum. All such remedies assist in bringing about a normal condition.

It is a disputed question, which is preferable—devitalization by means of the pressure anesthesia method, or the arsenical pastes. Each has its followers. In the former the great dangers are:

1st. Causing septic inoculation.

2nd. After-soreness, too much pressure, thereby forcing an excess of medicine through the foramen.

3rd. Soreness through the solution not being thoroughly aseptic.

In the latter (arsenical paste), the danger of: (1) Eschdrotic effects through the carelessness of the operator in improperly placing agent in the cavity.

(2) Too long standing of agent causing too great a death to tissues. This may happen through carelessness of patient not returning at given appointment.

In my opinion, it is the exclusive absorption of the arsenic that causes the intense discoloration of the teeth, not solely because this agent has been used, but rather the carelessness in its use.

(3) Soreness produced by application of devitalizing agent. Let me take up these several points for a few minutes. In pressure anesthesia.

SEPTIC INOCULATION.

I believe that the causes usually laid to the toxic effect of the cocaine and similar agents are not so often directly due to this effect as said to be. We give too little thought to the extensive bacteria cultivation that has taken place in the septum of softened dentine which usually overlies the nerve cavity, and which, either from suffering on the part of the patient or fear of such on the part of the operator, is too often left. However, this, in using either pressure anesthesia or the devitalizing paste, should be removed, as it also facilitates the application of the agent; so that here we would plead for the greatest care in endeavoring to place cavity in aseptic condition.

(1) By syringing both with warm water before applying the rubber dam; then by the use of heated peroxide of hydrogen, afterwards followed by treatment of some antiseptic solution, as formol, boracic acid, eucalyptol, etc. Then apply pressure anesthesia.

(2) Is solely in the hands of the operator to avoid; so no need of taking up the discussion at this time

ARSENICAL PASTES.

Careful operators avoid all troubles both from escharotic effects, and should advise patients against neglect of appointments for removal.

There is another method I wish to bring up, and will call this the "heroic method," useful in some cases previous to crowning. This method has to do with the excision of the tooth without any direct application to root. Let me explain. By means of ordinary cutting carborundum or diamond disc, cut into labial and palatine surfaces at cervical edge by a series of jabbing motions, keeping stone thoroughly wet by a stream of water from a syringe while so doing. Go as far as you can without causing pain to the patient, and you will be surprised to what extent you may encroach on pulp chamber if the method is followed out with exactness.

After cutting both sides as far as possible, and making groove on both the approximal and distal cervical edges with a serrated fissure bur, arrange new Donaldson broach so that it can be grasped immediately. Take excising forcep and forcibly cut off crown, and without loss of time force broach up pulp chamber and extract the nerve. Where I have done this there has not been as much pain as on the first pressure in applying anesthetic to tooth. This can only be carried out in incisors, and all depends on alertness of operator.

Believing the tooth to be devitalized, the great insurance against all after-troubles can be summed up in one word, "cleanliness."

You cannot be too careful in this regard. The washing of the root until the complete absence of all discoloration from blood clot or other stains on the cotton fibre is the only safeguard. Time spent in being particular in this regard is never wasted.

Next I consider the thorough enlarging of the root canal by means of the various sizes of twist canal cleansers of the greatest importance, because there is a lining in the inside of that pulp chamber similar to the periosteal tissue, and the function of this membrane—that of furnishing the media of connection between the real periosteal nerves and the pulp—is past; in other words, it is a foreign tissue, and must either be absorbed or removed. Nerve canal broaches do not cut out this membrane. This being done, wash the root with a solution of alphazone dissolved in alcohol, by means of cotton fibres on broach. You will find now a perfectly bleached white root. Neutralize by means of soda bicarb. solution, and fill the root either temporarily or permanently as is your custom; and I would suggest always a removable filling. But, says someone, you lack confidence in your filling. However, I guess the parable of the wise virgins holds good here, to guard against what might happen. Where arsenic is used, I find to apply as little as possible is effective, but that either must come in direct contact for satisfactory results in after-filling. True, it will work through dentine and produce devitalizing effect; but when this is allowed, the time is so long in working to this end that in the meantime pericementitis has developed, and then the treatment has become decidedly complicated.

It is best, in making an arsenical application, to dissolve a little pustolene in carbolic acid, dip pledget in this, and then take up arsenic powder; apply as gently to exposure as possible; cover with cement (Ash's, or some cement that is impervious to saliva), a very soft solution, protecting this again with Chloropercha or copal-ether varnish. Apply counter-irritant to gum, drying with chip-blower. The carbolic pustolene compound prevents trouble from gas should any part of nerve, or, as in molars or bicuspsids, any individual nerve, be septic. Too often pain that is attributed to devitalization has its source from this cause. Should soreness occur in individual roots immediately following attempted extraction of nerve, a treatment can be made of a preparation composed of alum, thymol, zinc oxide, and champho-phenique, applied on a pledge of cotton placed in pulp chamber, over which place ball of bibulous paper, pressing home, as in pressure anesthesia, forcing medicine into roots; seal with cement for from three days to three weeks, as time of patient and operator allows.

ROOT FILLING.

We all have our own, and each has his strong faith broken at times, but I claim as before, given a primary condition, careful and thorough cleansing by medicines and instruments, your faith

is less jarred by your filling, be that what it may, and your results are dependable.

SEPTIC CONDITION ON FIRST DIAGNOSIS.

We do not, I fear, place enough dependence on the use of boiled water syringed into the roots in these cases. In every case wash the roots with plain hot water as hot as patient can stand it, then with abscess syringe force it into the roots. Next use hydrogen peroxide (I always boil peroxide of hydrogen in test tube over lamp (1) because it makes it absolutely fresh, consequently stronger in action; (2) not so painful to patient.) Always follow peroxide by the use of some such agent as formolid (diluted), then wash each root thoroughly with alphozone and alcohol by means of broach swabs until you absolutely have no discoloration.

If led to believe there is a blind abscess, I place in pulp chamber lightly some alphazone powder on wet pledget covering with bibulous paper filling; continued moisture from saliva dissolving powder, which, by capillary means or gravity force, is passed into roots to seat of trouble. (Explain use of bibulous paper.) Next treatment follow system outlined in previous part of paper.

ABSCCESS WITH SINUS.

This presents in diagnosis a different aspect. It takes years to understand how kind, and perseveringly so, nature is in her efforts to bring about a normal condition. The sinus is, dentally, nature's safety valve. First treatment is externally dealing with the approach to root from sinus (given, of course, that the cavity is open and free). First, find out direction followed by sinus, then wash with hot water by abscess syringe. This prepares the way for treatment through the root. Open roots, cleansing as before. When apex is thoroughly opened, syringe hot water through; then when satisfied that conditions are free, syringe, with assistance of rubber washer plug, 50 per cent. solution hydrogen peroxide, followed with hot water; then a solution of commercial carbolic acid, diluted 50 per cent., previously boiled in test tube, having always the eye on gums watching for the white eschar that must appear when carbolic solution passes out; immediately stop pressure. Dry out root and tooth; fill with pustolene-campho-phenique formo cresol compound. Seal up at once, arrange for appointment in a week or ten days, and this treatment will rarely be found wanting in the desired results.

EXTENDED SINUS.

First lance gum, freeing pus; wash with warm water, etc. Follow treatment of root in syringing, then for outward treatment. After thorough treatment in above manner, pack pocket with anti-septic gauze saturated with aristol—chloroform-cassia compound—and in from one to two days pack passes out; abscess cavity heals.

CARIES OF BONE THROUGH LONG-STANDING OR CONFINED ABSCESS.

Treat tooth as previously stated. Open abscess. Serus discharge definitely corroborates diagnosis. Curette or scrape bone. Wash with hot water, then with a solution of absolute alcohol and alphozone, followed by hot water and soda bicarb. solution. Pack with gauze as above. Amputation of apical end of root has been resorted to, but I have never found it necessary for such treatment. Where abscess has been of such long standing as to destroy septum between roots, and has located different pockets on roots, it is most difficult. I know of only one method of procedure, and that I have resorted to only in cases of bridges where a pier would be an absolute necessity.

In the case of a lower molar, grind down to within such a distance of gum line as would retain a band for crown; with carborundum disc divide roots, giving parallel lines to roots; treat separate roots; band and crown with molar grinding surface.

In upper molars either remove buccal or palatine portion, as your judgment suggests, and proceed as in ordinary treatment. In all septic conditions presenting constitutional absorption of pus, as indicated by chills, anemic appearance, etc., advise dose of Rochelle salts.

Where there is neuralgia, advise compress made by placing Epsom salts in thick cotton bag, heating by applying boiling water over it (not enough to dissolve), placing under ear and over ramus of jaw, held in place by flannel bandage tied over head.

Again, let me repeat, "Cleanliness is next to godliness," and there is no place I know of where it so illustrates the demands of that strong statement as in the dental office, and in no operation of the dentist is it emphasized in all its strength more than in the treatment of devitalized teeth.

PYORRHOEA ALVEOLARIS.

GEO. A. BEATTY, D.D.S., L.D.S., OTTAWA, ONT.

Read before the Ottawa Dental Society, February, 1911.

It is with a great deal of reluctance and a deep sense of temerity that I come before you this evening to present a topic of such moment and importance, and I hesitate the more because of so much being said and written by the leaders in our profession and the scientific world.

Pyorrhea alveolaris is a term which, strictly defined, means a flowing of pus from an alveolus. The term is applied in dentistry to a complexus of pathological conditions which more or less clearly indicate a specific disease.

That pyorrhea alveolaris is not a recent disease, or one due to modern constitutional states alone, is rendered evident from the examination of the skulls of ancient as well as modern races. The

alveolar processes of many crania widely separated, both in time and in locality, exhibit marked impairment of structure which bears the closest resemblance to that presented by the processes which were known to have been the result of pyorrhea during life.

Literature furnishes very contradictory statements regarding the etiology of pyorrhea alveolaris. As early as 1867 theories were advanced. Magitot in 1867 was of the opinion that the disease was the result of constitutional disturbances. Riggs in 1875, and Black in '86, asserted that the disease was of local origin, while those favoring uratic deposits were Rhein, in '86, Marshall, in '91, and Pierce, in '92-4-5, and Darby later. It has not been proven that a specific micro-organism is the cause of this disease; however it has been determined by Miller that micro-organisms are associated with this disease.

The fact that pyorrhea alveolaris is seldom found fully established before thirty years of age, but is common after that period, and that it occasionally occurs in youth, or even in childhood in association with some pronounced systemic state or disease, strongly indicates a systemic factor in the more pronounced form of the disease.

The argument that pyorrhea alveolaris is of a purely local origin, because it disappears after the tooth is extracted, is no more sound than would be the argument that gout of the great toe is of local origin because it disappears with the amputation of the leg. Pyorrhea is a disease of the dento alveolar joint, and the extraction eliminates that joint.

Gums receding is a common occurrence in this disease. As long as the gum is formed normally and has a sufficient body at the gingival margin through which good healthy blood flows freely there will be no recession, even though you may have pyorrhea alveolaris in an advanced stage; but if the gum is thin, with not enough body to it, and the blood vessels are small, particularly as it is the terminal of many blood vessels, it is probable that under certain conditions you will get recession of the gums. Investigation and experimentation have shown that blood under certain conditions is not as fluid in the end arteries as it should be; for instance, where it contains too many urates, or when elimination is defective, as in the case of diseased kidneys. Now, supposing the blood pressure, which under the stimulation of faulty elimination has become increased and subsequently decreased through pathological condition of nerves, which is the logical consequence of over-stimulation, then, of course, nutrition will be but scantily supplied to the portion of the body fed by the end arteries, and the gum tissue which is so fed, being drawn tight over the canine eminence, or the palatine portion of a molar or any other part of the alveolus which is prominent, will find great difficulty in keeping its gingival margin alive. In fact cases are known where, on account of the whole anterior part of the alveolus being prominent, the gum tissue has disappeared over the roots of all of the anterior teeth.

This pathological condition may occur in connection with pyorrhea as it is usually recognized or without it, but pyorrhea with pus pockets and recession of the gums have for their origin practically the same causes and appear respectively in persons of different anatomical structure, the difference being, of course, that where we have the ordinary pyorrhea the disease is in the pericementum. We therefore expect to find pus pockets in patients whose gums are full and well supplied with circulating blood, and recession in patients and in places where the gums are thin, drawn tight and poorly supplied with circulating blood.

The receding of the gums is often caused by a tooth brush which is too stiff being rubbed across the attenuated gum tissue; strong alkalis, principally in the form of soaps, will cause recession, also some acids. The principal one is lactic acid, which is formed in the affected part. The free margin of the gum allows particles of food to get under it, which are invaded by the micro-organisms of the mouth, and as a result of their labor we have lactic acid formed.

In the treatment of pyorrhea alveolaris you can go a long way towards prevention of the recession of the gum and certain kinds of pyorrhea by keeping the teeth perfectly clean by the proper use of the right kind of a tooth brush and the proper materials and the correct method of using the brush.

We must abandon the use of soaps in the mouth. The generation of lactic acid under the free margin of the gum will be checked by making the roots smooth, that is, by thoroughly cleansing them.

The most important consideration in the instruments used for the purpose of removing the deposits from the sides of the roots beneath the gums are: first, that they shall be so thin that they will pass readily into the pockets formed in the alveolar wall between the root of the tooth and the gum; second, so flexible that when the flat side of the instrument is laid against the side of the root a downward pressure will cause the instrument to glide over its surface, removing any concretions that may be thereon, but not cutting into the cementum. For this purpose chisel-shaped instruments are preferable.

No instrument with a draw cut can remove these deposits with the same thoroughness as one operated with a push cut. Great care should be exercised in the use of pushing instruments to avoid forcing the dislodged particles into the deeper tissues. Many failures to arrest the inflammatory symptoms in these cases can be traced to the fact that some small particle of adherent deposit has not been reached. Therefore the importance of the thorough removal of every particle of the deposit from beneath the gums cannot be *over-estimated*. The scaling should be alternated with the washing out of the pockets with a 5 per cent. solution of hydrogen dioxide, which washes out the detached particles of calculus and disinfects the parts.

Some deposits on the more distant portions of the roots are very difficult to remove. Such concretions may be dissolved by the

injection of some acid, such as a 30 per cent. solution of hydrochloric acid or a 25 per cent. solution of trichloroacetic acid, which, through its caustic action, destroys a large number of the bacteria and also the neighboring granulation tissue. The thorough destruction of the latter is of the greatest importance to insure a permanent cure, and as I stated previously a solution of hydrogen peroxide should be used freely by the patient as a mouth wash without any hesitation. The continuous use of astringent and antiseptic mouth washes is highly indicated. In the treatment of this disease constitutional treatment should always be resorted to, so that waste products may be eliminated, and this is a very important factor.

It is often necessary to resort to surgical means in the treatment of this disease. Among the teeth which indicate surgical treatment are those which are fairly firmly situated in the jaw and have a deep pocket at some location about the root. The tooth becomes sensitive to thermal changes at first; and later becomes quite sore to the touch. They give the patient a good deal of discomfort, and most frequently occur in old men. As the pocket deepens and the free margin of the gum about the neck of the tooth becomes loose food debris, together with micro-organisms, enter. The tissues become irritated from the poisons of the infection. They thicken at the neck, which prevents drainage from the deeper portions. The tighter and thicker the gum becomes the less chance there is for drainage to occur. As the infection goes on the patient bears a good deal of pain.

The rational treatment is to make efficient drainage by lancing freely, curette and disinfect the cavity and put the parts at rest. It is often quite impossible to make drainage while the free margin of the gum is intact. Therefore it is necessary to use discretion in lancing, sometimes severing the free margin of the gum and at other times leaving it intact.

I hope I have said something to bring out a full discussion on this important subject, so that we may exchange ideas freely and be mutually benefitted; if so I will feel amply repaid for my feeble efforts.

INSPECTION AND CARE OF SCHOOL CHILDREN'S TEETH.

BY A. E. JAMIESON, D.D.S., EDMONTON, ALTA.

Read before the Central Alberta Medical Association, February, 1911

I wish to thank the Medical Association for inviting the dentists of the city to this meeting. In the discussion of the subject of medical and dental care of school children, we meet upon the common ground of the alimentary canal. As dentists, we have charge of the first three inches, while, as physicians, you have charge of

the succeeding thirty-two or thirty-three feet. The statement has been made that if the functions of the first three inches are properly performed under proper conditions the succeeding part will take care of itself. I can say positively, however, that if the functions of the oral cavity are not properly performed it leads to many ailments and disorders of the digestive and assimilative organs, and, more remotely, to many disorders of the whole system; for faulty mastication means faulty digestion, faulty digestion means faulty assimilation, faulty assimilation means faulty metabolism, faulty metabolism means faulty physical development, and further I may say faulty physical development means faulty mental development, and faulty mental development means faulty citizenship.

The care of school children's teeth is a subject which is attracting a great deal of attention at the present time; and justly so, for if "The boy is father of the man," it is only fair that the boy should have the best chance possible of becoming the best man possible, which he cannot do if he is handicapped at the start and through the formative period of life by a poor masticatory apparatus. The discussion of the subject is timely, for on every hand we hear, "Why do children's teeth decay so early?" "Why have I such poor teeth?" "My father had good teeth." "My grandfather never lost a tooth." In fact, if the ravages of caries cannot be stopped, it will not be long till the human race becomes edendulous. Scientific men to-day are turning their attention more than ever to the study of the prevention of disease, and in dentistry, by prophylactic measures, prevention of disease is also possible.

The subject must be dealt with from the start, and the medical man has the first opportunity. The choice of food for the infant and growing child should embrace such elements as go to the formation of good tooth substance, and the child, instead of being brought up on pap and avoiding crusts, should be taught to give its teeth good exercise on wholesome hard food, so that the growing parts may be encouraged to become strong and resistant tissue. The child should be taught to chew its food well, for the oral cavity has two functions, mastication and insalivation, to perform. The importance of attention to teeth at this early age is great, when it is remembered that the permanent teeth are in course of formation from birth, the first permanent molars and anterior teeth beginning to be formed even before birth, the bicuspid from the third to the fourth year, the second molars from the fifth to the sixth year, and the wisdoms from the ninth to the twelfth year. Teeth, unlike any other organ or tissue of the body, do not change. As the tooth erupts, so it will remain, so far as nature is concerned, till the end of the chapter; therefore the care of children's teeth, even prior to the school age, is of greatest importance; and here again, the physician, going as he does into the home, has a duty to perform in regard to instruction in the care of children's

teeth, for a child's chief duty is to eat, which it cannot do properly unless it has good teeth. In no department of economy does the proverb, "An ounce of prevention is worth a pound of cure," bear so much weight as in dentistry. It is a three-fold economy, in time, pain, and money, and one or all of these applies to everyone. But for the child, the one, pain, particularly applies. However, by systematic care and frequent inspection, if a cavity do be found, it can be easily repaired, and not accompanied by the pain of the later stages. The deciduous teeth should be retained till their successors erupt, not only for the purpose of mastication, but many irregularities of teeth and malformed jaws are due to the too early loss of the first teeth. The functions of the deciduous teeth are not complete till the permanent ones come to take their place.

Dr. Dunn, the medical inspector of the schools in Edmonton, kindly asked me to accompany him on his inspection, but unfortunately, so far I have been able to visit only one room, which was in the McKay Avenue School. This is the site of the oldest school in the city, and in the heart of the wealthiest section, so that the result here should be better, if anything, than in other schools. A class of girls and boys from 8 to 10 years of age was examined. I found 20 per cent. had received dental attention, 60 per cent. required immediate dental attention, many more had required it; but as this is the age of the normal loss of many teeth, little could be done but allow them to go. Fifty per cent. had abscesses; 39 of the 40 examined had either temporary or permanent teeth decayed. Only one was free from caries, and had irregularities which would require the services of a dentist to correct. This report is not of much statistical value, for it deals with only one room, but I am convinced that the condition in Edmonton does not differ to any great extent from other cities where regular dental examination is carried on, and the reports show from 70 to 90 per cent. requiring attention. Dr. Dunn's report of this same room is divided into three classes—Good, Fair and Poor—and shows about 75 per cent. in the fair and poor classes. At the present time, the poor class only is being reported to the parents. I would recommend strongly that both classes—Fair and Poor—be reported. If a tooth is affected at all, the sooner it be attended to the greater the chance of permanent salvation; in fact, many in the class Poor were utterly beyond redemption. What struck me most in my examination of the room was the number of deciduous teeth that had become utterly useless for chewing, not only on account of extraction, but on account of cavities and abscesses. A person cannot masticate perfectly on a broken-down and lame tooth; and the rule in this case holds as it does in extraction, that the loss of one tooth means the loss of two, just as one side of a pair of scissors is useless without the other. In my report the 60 per cent. requiring immediate attention were, in nearly all cases, first permanent molars. This is often mistaken by parents for a

baby tooth, coming, as it does, at six years, and slipping in behind the first teeth, it is very often allowed to decay and be extracted. This tooth is the greatest tooth in the head and should last the life through. Aside from its use in mastication, in the growth and development of the jaw and consequently the facial expression, its retention is of the utmost importance. During the loss of the deciduous teeth and the eruption of the later permanent ones, the first permanent molars are the corner-stones of the bite.

The oral cavity has been likened to a germ incubator, and it truly is. Germs require heat, air, moisture and a proper medium. All these are supplied in their most perfect condition in the mouth, so that, with the implantation of the germs nothing could be expected but a lusty growth. In the oral cavity there are almost constantly no less than sixteen different varieties of pathogenic, besides saprophytic, germs, to say nothing of the occasional wanderers that are gathered up. Fortunately, there is a natural resistance which keeps the number in check. On this point I am inclined to think that the number of microbes found in the mouth is an index to the general condition of the system. On the other hand, the general condition seems to have a marked effect on the condition in the mouth. It seems to be a rule which works both ways. I would like to draw the attention of the general practitioner to his duty to his patient in regard to instructions for the care of the oral cavity during lengthy illnesses. We dentists hear repeatedly, "The medicine ruined my teeth." I am inclined to think, however, that it is more the condition for which the medicine was taken which lowers the resistance of the patient, and the lack of care of the oral cavity that is most to blame. Many forms of bacteria found in the mouth are also found farther down in the alimentary canal and must necessarily affect the general system. Be that as it may, with conditions so favorable for bacterial development, what can be expected in an uncared-for mouth? The condition is simply horrifying—carious, broken-down teeth throwing off poisonous by-products, food of all sorts simply rotting in the cavities and between and about the teeth, abscesses exuding pus into the mouth, or the pus being absorbed into the system. It is claimed by some authorities that these are almost always infected with tuberculosis. The germs of pneumonia and diphtheria, beside many other diseases, are frequently found in the mouth. How much more likely are these to develop in an uncared-for mouth than in a clean one. We demand pure food and pure water, but imagine every bite being insalivated with such a mixture as I have described. What chance has the child to grow and develop? How easy it is to acquire and transmit disease under such conditions. Here let me emphasize the importance of the "Don't Spit" Law, and care of drinking cups. Such conditions do exist in the majority of school children's mouths.

Dr. Osler says, "If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I

would unhesitatingly say, defective teeth." Faulty teeth mean faulty health. A great many otherwise nervous and backward children are suffering from the effects of bad teeth, and a marked improvement has been noted when the teeth are put in good condition. A gentleman of much experience in juvenile crime assures me that it has been found that vicious tendencies in children have been definitely traced to bad teeth.

It is almost axiomatic in dentistry that clean teeth do not decay, so the motto for the child, in fact, for grown-ups as well, should be: Clean! Clean! Clean! morning, noon and night. (I found that a large number of children I examined had tooth-brushes, but only a few showed evidence of it; in fact, many could not tell when they had last used one. I think the teachers should require clean teeth as well as clean hands and faces. The choice of a brush is of importance. A brush of such a size that it will readily pass beyond the back teeth, the bristle tufts placed in corresponding rows, the central bristles of each tuft somewhat longer than the others, so that they may readily penetrate into the grooves and pits and as far as possible between the teeth. In the manner of brushing, the child should be carefully instructed. A sawing motion does not clean between the teeth, while if the brush be carried in a somewhat circular motion, it will pass along the festoons of the gums and down between the teeth as well. The teeth should be cleaned before breakfast and after each meal and at bedtime, but if only once, then bedtime is the best time, for during the day the tongue and cheeks, and consequently the fluids of the mouth are more or less in motion, and to a certain extent preventing the lodgement of bacteria; but at night they are quiet, and there is consequently greater danger. Pure water and a tooth-brush, coupled with a little enthusiasm, will ordinarily be found sufficient, but a good tooth paste or powder may occasionally be used to advantage. There is little danger to the enamel from over-brushing. The use of antiseptic mouth-washes should be by prescription, unless something of a very mild nature, for it is pretty generally believed that a wash of sufficient strength to be of any great service may become harmful to the tissues of the mouth.

The condition which prevails in our schools is largely due to the lack of knowledge on the part of parents and children, and I would recommend that a circular be supplied by the School Board, setting out such information on the subject as would be of interest, and giving a code of rules for the care of the teeth. I am convinced, also, that it is well-nigh impossible for a medical inspector to do justice to the teeth of the children. I believe I have the support of the Medical Inspector in this. I stated before that it was a lack of knowledge on the part of parents and children; it is also a matter of carelessness. It would require all the energy of an Inspector to look after the oral cavity alone. To arouse interest on the part of the parents and children by short talks to the classes, by practical explanations or demonstrations of the im-

portant points, by personal instruction as well as frequent examinations.

There are schools for the deaf and dumb; there are schools for the blind, and there are open-air schools for the children who require them. New conditions require systems. Every child has a right to demand a fair chance, and here is a case where 75 per cent. of them are handicapped at the formative and through the adolescent period, critical times when the child requires every assistance to tide them through; many are maimed for life largely on account of neglect. It surely demands some system for its remedy. On the other hand, and apart entirely from the moral obligation to the children, I am convinced that the city would be amply repaid for any expense they might go to by the saving of medical and dental fees, for, as I stated before, by frequent examination, if anything be found requiring attention, it will take the least time, pain and money to repair it.

In closing, I want to enlist the support of the medical profession in our endeavor to educate the public in the understanding that sound teeth and clean mouths go far to produce good health and good citizens.

ELECTRICITY FOR DENTISTS.*

F. D. PRICE, D.D.S., L.D.S., TORONTO.

CHAPTER I.

THE VALUE OF ELECTRICITY TO THE DENTIST.

Every conscientious dentist wishes to render the best possible service to his patients, and that at the least possible exhaustion to himself. To this end he reviews his journals, he reviews his whole college curriculum. A dentist with a wide range of knowledge has said that, "There is to-day no one subject taught in our dental colleges that will enter so largely and frequently into the best possible service that we as dentists can render as electricity."

Progress is by acceleration. We have advanced more during the last twenty-five years than during the preceding thirty-five or the fifty preceding that period, or a century preceding that. We have moved into the electric age. Let the reader compare this with any preceding age. Electricity has entered largely into every occupation, commercial, engineering, transportation, scientific or medical. It has shown that whatever was accomplished before without electricity can be done better by electricity, while electricity has opened up new fields of enterprise, not even existing to us before its advent. We dentists seem as slow as any to recognize these facts or to possess ourselves of the knowledge that will bring

electricity to our service. As it was shown to be intimately related to all other forms of energy, so we soon may find it to be the medium of expression in all forms of enterprise in every call of life. It will be the soul of things. Take a few present-day examples.

The telephone rings, and by electricity a lady makes an appointment. She arrives in an electric car or carriage, and probably takes an electric elevator up to the dental office. She touches an electric button to announce her presence, and is shown into a parlor beautified and lighted by electricity. In winter it is heated by electric radiators and in summer ventilated and cooled by electric fans. The air is purified by ozone electrically produced. She does not fear dental operations, for their terror has been banished by the possibilities of electricity. She has been suffering severely with neuralgic pain in her right temple, and a tooth is suspected as being the cause. Let the dentist now go over all his curriculum, from anatomy to jurisprudence, and no subject will help him but electricity. He turns on the electric foot-warmer to allay his patient's nervousness and reduce blood pressure in the head. He notes that several teeth have large fillings, but none more sensitive than others to mechanical tests. He has an instrument that can supply a delicate electric current fully under control. He insulates proximal fillings if necessary by small pieces of rubber dam, and touches the fillings in one tooth after another with one electrode, while another like a mouth mirror pushes the cheek aside. Normal teeth give a sensation of warmth from the current. One tooth gives no sensation unless the current is very much increased. He suspects alveolar trouble from a dead pulp. His ever-ready X-ray is used, and in a few minutes he has a bromide print that verifies his diagnosis, and in ten minutes more a negative clearly revealing the area of infection. In the meantime his electric engine, that for smoothness and control no foot engine can compare, is removing the filling preparatory to cleansing and medicating putrescent roots. In the meantime a patient has called in agony from an acute alveolar abscess. She is exhausted from long suffering, having been awake all night. There is no trouble here in discovering the offending molar. The least percussion upon it cannot be borne. Water that is always sterilized by electricity, and always kept warmed to a comfortable temperature in an electric heater, is used to remove the debris from the cavity. An electric lamp like a sunbeam reveals the openings of the different root canals, while the lamp itself is screened from the operator's eyes. The canals are quickly cleansed, a solution of cocaine introduced into each of them, and a pledget of cotton saturated with the five per cent. cocaine solution placed into the pulp chamber. The positive electrode of the ever-ready cataphoric appliance is placed into this cotton, while the negative is placed in the hand of the patient. A few milamperes of current is turned on, and the patient soon reposes comfortably, for cocaine has painlessly entered

the area surrounding the roots. In a moment the cotton and cocaine solution is removed from the tooth and a ten per cent. solution of potassium iodide introduced in its place. The current is now reversed, so that now the electrode in the tooth is negative. In a few minutes the tooth, roots and abscess area are infiltrated with a small amount of iodine, destroying or inhibiting the action of the bacteria and stimulating the circulation to carry away the inflammatory products. A suitable treatment is now placed in the tooth, and the happy patient dismissed to return at a later date for a more thorough cleansing of the tooth.

We may suppose that soon after the arrival of this patient, Miss B. is presented suffering from an impacted third molar, which has not yet appeared at the surface. We only need to hear part of the tale of woe the patient has to tell to recognize the history. Miss B. is made to sit in a comfortable chair with her head on a cushion. We may have a Finsen lamp, but if not we may have a 100 candle or even a 50 candle incandescent lamp with a suitable reflector that will focus the light and heat on a small area. At first the heat irritates the skin, but by adjusting the lamp and by a little massage the effect of the heat and light rays is so soothing that our patient is soon at rest and perhaps enjoying a much-needed nap. The capillaries become enlarged, the arterial pressure is relieved, and the swelling reduced. This has been accomplished by the combined effect of the heat, the light and the ultra violet rays, all of which penetrate deeply. Again X-rays are requisitioned, a skiagraph is made, and further treatment made intelligently. Electricity has given life for disease, comfort for pain, and eyes to see the relationship of the third molar to the ramus and to the second molar.

Let us suppose that Mr. M. is presented with pain in the face from the palate to the orbit. How shall we examine for antrum trouble? Shall we first bore a hole in somewhere or extract the first molar, and from the lingual root socket enter the antrum and examine for pus? Electricity offers her hand again. With the room made dark, our electric antrum illuminator is placed in the mouth. One side of the face is pink with transmitted light. The other presents a dark zone in the centre, with light coming from the side of the nose and the alveolus. We may be quite sure of pus in the antrum. Again electricity is giving us eyes to see. Can it do more? In a few minutes a skiagraph is made, the whole floor of the antrum is shown, and an alveolar abscess is shown above the second bicuspid with fistula leading into the antrum. To only enumerate the cases that may be similarly diagnosed by X-rays would itself occupy a chapter.

Our next patient presents a condition that of all others is most distressing. The skin of the face itches, the pain shifting about, the teeth are extremely sensitive, dental operations are accompanied by extreme suffering and exhaustion. How shall we

treat an anemic patient suffering from neurasthenia? We may apply the positive electrode of our faradic current or we may do even better and apply the high frequency current connected with our X-ray outfit. A sedative effect is soon experienced, and our patient goes out feeling hopeful. She has an appointment for a treatment the next day, and she appears a half hour before her time. "Oh, doctor," she says, "I had the best sleep last night I have had for months, and I feel so much better to-day." Electricity alone has done it, and our assistant is instructed to give her another treatment. But the time comes when her teeth may be attended to, and we must not throw our patient back into her former nervous condition by the old painful methods. Rubber dam is placed on one or more teeth for insulation, and by cataphoresis cocaine is painlessly introduced into the sensitive cavities in just sufficient quantity to anæsthetise them. The operation of filling is performed painlessly. The second molar is found to have a large cavity with putrescent root canals. We cleanse the palatal root easily, but the buccal roots are so crooked and the canals so small that our finest broach fails to pass to the apex. We close the palatal root with gutta percha and with our ever-ready cataphoric instrument we introduce zinc chloride or iodine or oxygen into these tortuous canals and sterilize not the canals only but the whole tissue of the roots. Nothing is surer. The same patient has dreaded dental operations so much that she has allowed a central to decay until the crown is a shell, the tooth dead and very much discolored. Again the rubber dam is adjusted, but to this tooth only, the root is treated and temporarily stopped with gutta percha. Our sealed can of sodium dioxide or our twenty-five per cent. pyrozone is opened. We cover the crown of the tooth in the cavity and outside with cotton in which is imbedded the negative electrode from our cataphoric instrument. Keeping the cotton saturated with our sodium dioxide or pyrozone solution, we turn the current slowly on to four or six milamperes. We keep the cotton saturated, and in about ten minutes will probably find that the central being bleached is whiter than its mate. This again by electricity. In all the cited cases we have been applying therapeutic treatment to tissue not superficial, and perhaps in no instance could we with equal success by ordinary surgery or medicine.

A loose bit of canal broach in a root defies removal. The electro-magnet does it at once. A porcelain restoration is desired. What heat can compare to electric for a porcelain oven. Even its temperature is registered by electricity with a precision that need not vary one-half per cent. between the different bakings. What gold annealer is comparable to the electric, giving a new quality of softness to the various golds. The present laboratory electric lathe reduces the time for polishing and grinding more than one-half with greater ease and better finish. Compare the intermittent expulsion of vapor of water from a wriggling bulb syringe (for

the product of consumed gas is largely vapor of water) to the easy and direct application of air warmed to dryness, by electric heat. An instrument fits on the engine handpiece and directs a stream of warm air on the blades of the revolving bur. Thus the cavity is kept clear from debris, the bur is not clogged, the vision to the walls of the cavity is not hindered by the loosened chips, weak walls and decay are quickly removed, and all done painlessly, for warm air proves to be one of the best desensitizing agents. A root canal is wiped supposedly dry with cotton, then the heated electric brooch is passed in and the vapor emitted suggests that it were full of water. Medicine is placed in the canal, and by the same electric broach is vaporized and made to penetrate into the tubules of the dentine. Abrasion about the necks of the teeth is treated with silver nitrate, which is ironed in with an electric spatula, making sure the penetration. A crown post is broken off in the root of an anterior tooth, and the fragment must be removed for another crown post to be inserted. What danger as we bore beyond the point of vision lest we perforate the root. But an electric lamp in the mouth inside or outside the alveolus makes all the tissue, including the root, translucent, and the metal or cement in the root is opaque and black. Thus we can follow the contents of the canal to the apex if the canal be straight. A hurried examination is desired. The same lamp passed inside the arch reveals the extent of every proximal cavity by the dark shading it produces, even though an explorer cannot find some of them. By heating a case with a gas flame below it the investment is warped by the unequal heat and our bridge is a misfit. But now we heat it better in an electric oven in half the time and with sure results. If we use a bunsen flame the act of turning on the gas ignites it. We pick up our blow pipe, touch its point between two carbons, and it is alight. And many more uses of electricity might be enumerated. The purpose of succeeding chapters is to say some things we think a dentist should know about electricity and some of its applications in the profession of dentistry.



M. H. GARVIN, D.D.S., L.D.S., WINNIPEG, MAN.

President of the Dental Society of Western Canada.

PRESIDENT'S ADDRESS.

W. H. GARVIN, D.D.S., WINNIPEG, CANADA.

Read before the Dental Society of Western Canada, at Winnipeg, April, 1911.

Our Annual Meeting is at hand, and as President of the Society it becomes my duty to deliver an address, giving a message for your consideration, suggesting thoughts for the best development of this Society, and of its individual members. And let me add, in the words of the old bookbinder, "Kind brothers, if this, my performance, doth in aught fall short of promise, blame not my good intent, but my imperfect wit."

I cannot help feeling, as regards this Society, that it is a living organism, gradually growing from childhood into sturdy manhood; it looks to to-day and to-morrow, and its hope stretches out into the future, where it has the possibility of becoming the inspiring centre of dental life in all its branches throughout this Western world.

Its functions are, no doubt, or should be, research, the cultivation of high social relationships, the education of all its members—but in addition to that, it has, among its other duties, the function of the diffusion of knowledge pertaining to the dental sphere, in the widest possible sense, among all classes of our community, and here it is that we have a clarion call to service. The demand is upon us, a great door and effectual is open to us. One of the greatest opportunities with which I am familiar, possibly the greatest of modern times, is the one which just now confronts the dental profession in the question of the education of the public on the importance of oral hygiene and such prophylactic treatments as will arrest, and event prevent, disease, the systematic inspection and care of the mouths of school children, the provision for free clinics for those unable to secure service in the regular way. As a society, we are to be congratulated on having with us so able, pleasing and convincing a lecturer as Dr. Webster to speak this evening on this very important subject, and as a result of this lecture may some master spirit arise to direct and inform our feebler knowledge, and lead us in the doing of mighty things for our brother man: an opportunity which is knocking at our very door. At present the matter might be left in the hands of our representatives on the education committee, formed by the Canadian Oral Prophylactic Society, in which case these representatives might be instructed to act along a certain line, and to report to us one year hence.

The Canadian Oral Prophylactic Society are organizing educational committees in each Province. In Manitoba, for instance, this committee is composed of the President and two members of the Dental Board, the President and two members of this Society, the President of the Canadian Oral Prophylactic Society, and two

resident practitioners appointed by him. This will give a good, strong committee to handle educational matters in each Province, and I believe it would be well to give this our hearty endorsement.

I would express the hope, also, that something might be done, even at this meeting, towards the appointment of a committee, either by you, as a body, or by your executive, if you prefer, to undertake some original research work, and make report at our meeting in 1912.

Another committee, which is at work among us, is the one in charge of the International Miller Memorial Fund—a fund being raised by the different enlightened countries of the world, in which Canada is taking her part, to commemorate the life of Dr. W. D. Miller, a man much admired, honored and appreciated, a man to whom the profession of Dentistry owes much. I believe that this most worthy object will receive, and is receiving, the most hearty support by our Western men—men broad and noble-minded enough to honor a great man, and encourage others to continue the work he gave his life to advance. And in this way, as in others, we of the West will do our share with the East, and even more; and so help make Canadian dentists a factor in the dentistry of the world.

At these gatherings we want our sister Provinces to the West better represented. To this end your Executive have revised the Constitution, which revision will shortly be read to you, for your approval. The object of this has been to give larger representation in the Executive to these more distant districts. We want more Western men here: we need them and they need us. Every able-bodied practitioner in our Western Provinces should make a great effort to attend our Annual Convention to hear the meditated opinions of the greatest specialists in our profession: addresses well worth incorporating into our permanent thought. How many of us realize at times that the age has practically swept along without us, that being very busy with our personal problems, we have watched progress pass by with but a faint resolve that some day we will read up. To that man, and to every man who wishes to have the heritage that is his, we offer these annual gatherings, complete in social atmosphere, stimulated by inspiring essays, and clinics worthy to be heralded to a larger audience than has ever been our fortune to have assembled here.

Our world is moving at headlong speed. At such a speed do we rush that soon a year will see changes that formerly engrossed a century. So suddenly are we confronted with new problems that at times it would seem as if the dead past had forgotten to bury its dead. But we are not going to slip into some eddy in the current and soon become but relics of an extinct age, but we are going to rise to the occasion; rush forward to meet our opportunities, and with active brain join hands with the men who, in office, factory and field, are making a nation.

DISCUSSION.

DR. GREENFIELD: When our President handed me his address to open the discussion on it, I felt a great responsibility. He has dealt with matters that are of vital importance to the dental profession at large.

First of all, the importance of our society. I am sure there is not a member present who has ever had the slightest regret at being a member of this society. The meetings, coming in the spring, act as "a spring tonic" to the dental profession, to stimulate us to better work in our profession and to give us new ideas and new ways of benefitting the public and doing our very best work.

The social relationship that exists in this society, I am very pleased to say, is probably something to be very, very proud of, and something that we as Westerners have always tried to uphold. We try to give everybody a good time who comes here, both socially and educationally.

Like all other great institutions, the Dental Society of Western Canada has a great purpose, and that might be classed under two headings: first, a purpose to its members in benefitting them individually, and, second, a purpose to the community at large, which we are trying to carry out in the idea of the education of the public along the lines of oral hygiene and prophylactic treatments. This subject I know will be handled admirably by our friend Dr. Webster, therefore I do not care to say very much about it. I am sorry to say that our society here has not advanced along prophylactic lines as rapidly as the societies in Ontario, but we are getting a start, and I trust that in the future you will see great things done along those lines by the Society of Western Canada.

I believe there was something done at our last meeting along the line of representation of the Canadian Oral Prophylactic Association. I do not know that there has been very much progress made. There was a committee formed, I believe, at the last meeting, and I have been unable to find out what the results of that were or what they really did along these lines, and I might differ a little or probably find a little fault with that suggestion. If the work is to be left in the hands of a committee again, for them to report one year hence, that means that probably there will not be very much done for another year. There might be some way of remedying that and getting down to business a little sooner.

The next point mentioned here is the International Miller Memorial Fund. There is no doubt that the majority of the members here are acquainted with the idea of this fund. To my mind the principle of it is excellent. There seems to me nothing better that could be done than to have a fund of this kind to reward and to honor—not so much to reward, because the reward will be insignificant, but to honor men who are spending their

time in research work for the benefit of the dental profession at large. I think these men should be honored in some little way by the dental profession the world over, and I am very glad indeed that the President has taken occasion to mention this important subject in his address.

The next point is in regard to the representation on the executive of members from the far Western Provinces, the Provinces of Alberta and Saskatchewan. To my mind the idea that the Constitution is to be revised so as to include a larger representation on the Executive is a very good idea. We want to get more of these Western men in with our work here. Some day we want them to handle this meeting. We don't always want to have this meeting in Winnipeg. We want these men to get a hustle on them and hold it in Calgary or Edmonton. We want to get out a little bit, you know; we don't want to stay at home all the time. There are just as good men out West as we have here in Manitoba, and there is no reason whatever in my mind why these men should not get together and have a convention out in these places I have mentioned, and I hope the meeting will endorse that idea to include a larger representation of the executive so that we will get in closer touch with the Western men.

I am sure, gentlemen, that we must congratulate Dr. Garvin for this excellent address.

DR. COWAN: I might ask Dr. Webster to state the condition in which the Miller Memorial Fund is at present.

DR. WEBSTER: I am not aware just what condition the fund is in at the present moment. I do know, however, that the object of the fund ought to be already set forth. In the first place, the idea is to collect such a sum of money, the income from which shall be given annually as a reward for research work such as Miller did himself. It makes it international. It is not belonging to Germany or the United States, the home of Dr. Miller, but to all nations of the world.

I may say that the campaign has been well conducted and well set forth in Canada by the Chairman, Dr. Reade, of Toronto. In the East the fund has reached reasonable proportions. We are doing very much better than they are in the United States in proportion to dental population, in connection with this fund; we are doing very much better than some other countries, and yet there are small countries with small populations which are doing very much better than we are. In Toronto I think the committee have collected somewhere in the neighborhood of \$500. Winnipeg has responded nobly. The Eastern Provinces have done likewise. It only requires some person to take a hand and present this matter to the members in the West to get the necessary funds to establish Canada as one of the nations of the world in Dentistry.

I should like to say a word, if the President will permit, in connection with the education of the public, a term which, per-

haps, we ought not to use. It is not quite fitting, I think, perhaps, that we should feel ourselves as educators of the public and have them believe that they are to be educated. Some doubt has been passed upon the expression, and I believe rightly so. However, what we mean is, that we shall lay such information before the people that they will appreciate the value of oral hygiene. To that end we have, in Canada, an organization known as the Canadian Oral Prophylactic Association, which is the public educational committee of the Canadian Dental Association. It is their object to deal with the whole Dominion and not with any province in particular, and they be responsible to the Canadian Dental Association. They have some funds to expend, and they desire to get an opportunity to expend them in every province in the Dominion. They desire not to do any educational work themselves; they desire to have that responsibility placed upon every province. They desire to stimulate each province to do its own educational work, and each province should stimulate its local organizations to do educational work in each municipality. It is not the purpose, remember, of the Canadian Dental Association to step into educational work and dabble in things where they ought not to be. Let each province look after its own.

To carry out that idea the Canadian Oral Prophylactic Association decided that they should ask the provincial organizations to appoint an educational committee. Besides that, the idea was to have the official bodies in each province appoint a committee of three and the Canadian Dental Association, through the Prophylactic Association, appoint three, all of whom must be resident in the province, of course, in which the work is to be done. Now, in that way every organization is represented. The Canadian Dental Association is represented through its committee, the official body or board is represented, and the voluntary bodies are represented; thus every interest is represented. Such a committee, then, ought to carry forward this work rapidly. What may they do? It is the expectation that in every center, such as Winnipeg, Halifax, Montreal, Toronto, and British Columbia, there shall be a secretary, who shall have in charge such things as lantern slides, diagrams, models, and specimen of lectures, etc., to be used in educational work. For instance, suppose there is a meeting of the Teachers' Association in Moose Jaw, there is an opportunity for the central committee here to see that somebody is represented at that Association on this subject, and to see that he is supplied with the outline of a lecture along the line on which he would like to deliver a lecture. He is supplied with the necessary cuts or lantern slides or diagrams, or any other matters that he might wish to use for that lecture. These things will be supplied by the central committee, the outfit will be sent to the central committee, say, in Winnipeg, who will keep it in order and send it out. I think in that way educational work throughout the different centers will go on much

more rapidly than having efforts disconnected in every sort of way. To give you an example, at the present time, I had great difficulty in getting, out of probably 200 slides that we have, sufficient to bring to Winnipeg at this time. We had to call upon the Ontario Committee and get some of theirs to send to Halifax, where there was a Tuberculosis Convention being held; the town of Essex Center in Ontario wanted slides, and I wanted some here in Winnipeg, and we all happened to want the same kind, so that there was great difficulty in getting it arranged even at the present time with the amount of equipment which we have. If that equipment were here and kept here permanently and this educational work went on you would find that it would be necessary in Winnipeg to have at least two or three sets of equipment for delivering public lectures. The work would go on so rapidly you would be surprised. In Ontario we can hardly get our material back in time to send it out to some other place.

DR. COWAN: I am exceedingly pleased to hear Dr. Webster and to get this information. It is a pleasure to you all. Is there any further discussion upon this address. If not what do you wish to do with it? Do you wish to adopt it or refer it to the committee?

DR. GARVIN: I would move, Mr. Chairman, that we ask the executive to appoint a committee to engage in original research work and report at our next meeting. I say that because it would be almost impossible to appoint that committee here without consulting the men first and obtaining men who would be willing to undertake that work. I would also include in that motion that we heartily endorse the effort put forth by the Canadian Oral Prophylactic Society, acting under the Canadian Dental Association, in educational matters, and that the President be asked to appoint our representatives on that committee.

The motion was seconded by Dr. Ross and carried unanimously.

THE PERSONALITY OF THE DENTIST.

T. H. O'NEIL, D.D.S., FORT WILLIAM, ONT.

Read before the Dental Society of Western Canada, April, 1911.

It is with due reluctance and some temerity that I address you members to-day in this paper; from the fact that I am a novice in anything pertaining to the literary aspect, and secondly from the fact that the subject which I have chosen is one which is almost illimitable in scope and of a very broad nature.

In the presentation of this article I do not hope for an instant to cover the subject thoroughly, but I wish to draw your attention to a few points and then enlarge upon these. These few points are the basis upon which this article is written, and it is needless

to say I consider them very essential ones in the personality of the members of our profession.

I feel I shall not tell you anything new to-day, but shall only give to you a reiteration of ideas which you, undoubtedly, have seen written, or heard uttered, or, at one time or other they may have been your very thoughts. These ideas cannot be brought too frequently to our minds, nor too forcibly, from the very fact that they give a foundation for thought, and, when the foundation exists we start to think; from thinking follows action; if we never have the thoughts we can never act. The action is always the result of the thought which precedes it; lack of thought is lack of action, and little thought is an inert life.

I shall crave of you to pardon the digressions in this paper. The writer well knows that he who digresses least has the most admirers. If you are patient you will be able to endure to the end.

In dealing with personality alone I work with a general subject, but in discussing the subject of the personality of the dentist I deal with a special subject, and it is necessary for me to work from the general subject into the special one.

Personality is individuality. It is a word with an infinitely broad meaning. It is the forces which lie dormant within us and those which are active, developed and being utilized that makes up a personality.

What are these forces? Perhaps no one knows, but as we use electricity without knowing what it is, so these forces exert an influence greater than that of electricity, although, as yet, it may not be correctly defined.

One of the great forces in the personality is magnetism; we see this power every day in the faces of men and women, in the painting of the artist, in poetry, in prose and in all the great achievements of men.

If you have read the life of Napoleon you will there see a concrete example of a magnetic personality. Wellington said of him "that his presence on the field of battle was equal to that of four hundred thousand soldiers."

I have seen men, and so have you all, that you have been literally drawn to: I might say that you could not stay away if you so desired, and it was that man's personality that worked on your emotions and that power of magnetism that attracted you.

Every member of our profession should try to develop magnetic qualities and the power of attraction and a pronounced personality. Personality is a wonderful business asset; it is the power that moves men to action, determines the harmony of the home and regulates national events.

There are men who have been gifted with wonderful personalities and great qualities and seem to possess these from their childhood, just as men are gifted in the arts, while others there are who have developed a personality by application.

In our field of work we come in contact with all classes of people; people of every walk in life, each one displaying to us his own particular emotions and traits: we see them in normal and abnormal conditions, and verily I say there is no one who has more golden opportunities of studying human nature than the members of our profession.

The associations which we have daily in our professional work are in themselves an education. No matter with whom we come in contact in our work, be he the most educated or the most ignorant, the man of highest office in our land, or the street sweeper, something beneficial can be learned from him.

It is well at all times to try and study your patient; much can be gained by observance, and we should try at all times to adapt ourselves to our environments. Of course one at all times must use his good judgment and be very discreet.

Our standards of morality should be the highest, and in this respect bring all your powers of discretion into play, as we are greatly exposed at times, and always try to remember that "Discretion is the better part of valor."

There should be no one more thorough or scrupulous in his work than the men of our profession. If a man be not thorough he cannot hope to be successful in his chosen field. If we are only inserting an amalgam filling we should take just as much care and try to do it as well as if we were inserting a Johnson gold filling or a difficult inlay. Not receiving as high a fee for the amalgam as we do for the gold, we are inclined, as I heard a man once say, "To slop in" the amalgam. If these principles predominate in our mind we should try to eradicate them and not listen to such suggestion. Insert the amalgam filling with the same spirit as you do the gold filling or inlay.

A great asset to the dentist is a cheerful disposition and an optimistic nature. Laughing cheerfulness throws light on all the paths of life. It is one of the most potent signs of wisdom: it is the patent of honesty and the hall mark of a good conscience. If we do not possess this noble gift we should resolve to cultivate it. Cheerful disposition, a smiling countenance and a soothing voice;

These faculties are within the reach of all of us, and we, as the sweet smile, the subdued speech, the hopeful mind are earth's most potent conquerors.

dentists, should strive to gain them. Once we have attained these we shall never forget the efforts which we put forth to gain them. If we do not possess them now let us try to attain them in the future. The reason we do not possess them is because we have never tried. It is wonderful what can be accomplished when we strive hard.

In the majority of cases the patients who come to us for advice and treatments are invariably bearing physical suffering. Upon their first visit to your office they are met by the man of the bright, cheerful disposition; their burden seems lightened upon your very

threshold, even before you have conducted them to your operating room. I have seen it, you all have, and we have all seen cases of the reverse.

If you resolve to be cheerful you will be also optimistic. It is the trouble that never comes that causes loss of sleep. Every dentist in this great and growing West of ours should be optimistic. The very country from the shores of Lake Superior to the Pacific Ocean is impregnated with this feeling, and it is this very feeling that first appeals to the newcomer to our land.

The members of our profession, one and all, should cultivate this feeling and bring it into their offices and their work because, being optimistic, you cannot help being cheerful. There should be no pessimists among us, and I sincerely hope there are none.

Our profession is on a sound basis; our professional standing is on a par with that of the physician and the barrister; the field is large and the country is not overcrowded; fate is kind to us and fortune is smiling on us, and she is going to continue to smile, even more favorably in the future than in the past. We should all endeavor to be sympathetic in our nature. In our treatment of our patients we should try and realize that these people are suffering, and we should at least be very patient with them, offering them all the sympathy possible. Sympathy at the right time and in the right place will work wonders for us all. Dickens says, "No one is useless in the world who lightens the burden for someone else," so you see our profession is by no means a useless one.

There is nothing which gives me greater pleasure in dentistry than to be able to relieve suffering. If you are called at three o'clock in the morning from your peaceful rest to relieve a violent malady in your sphere of work, go and do it cheerfully and be glad of the opportunity. Take pride in the fact that you are in a position to greatly aid that patient: no greater act can any man accomplish than that of the *relief of human suffering*.

One of the most difficult problems that we, as dentists, have to solve is the prevention of the insidious lowering of our standards. We all start out in our career with many ideals and resolutions, to live up to our standards, but by a process so insidious, so imperceptible, our standards are slowly being lowered, which we are totally unconscious of at the time.

The great danger lies in the fact that the dropping is so gradual, so imperceptible, that we do not realize the transformation.

Habit is such a tyrant that every time we dentists do an operation, whether well or ill, we tend to do it the same way as we did the last time.

A dentist who does not rigidly, persistently, keep his ideals before him and force himself to keep up his standards in his chosen profession, cannot possibly make the most of himself. We should strive with might and main and resolve that we will not allow ourselves to fall into loose and lax habits in our work.

We should take an inventory of ourselves; we should do it frequently; enter into ourselves as it were, and see how the debit and credit side of our books stand. We will undoubtedly find liabilities; well, we should resolve at once to eradicate them.

Concentration and meditation along the proper lines are very refreshing and beneficial. The habit is a mighty good one. Try to cultivate it.

We, as dentists, cannot hope to excel in our work when we are careless and indifferent about our dress and person.

We are all of a piece, and we cannot keep our standards up in one place when they are down in another. We are tied together so closely and everything about us is so interlaced that what affects one part of us affects all. No dentist can have quite as delicate an appreciation of lights and shades, of form and color and of proportions when he is conscious that he has neglected his bath and is wearing soiled linen. Slovenliness in his personal appearance will mar his self-respect and, when the self-respect standard is down the executive faculty, and, in fact, all the faculties, relax from sympathy.

We should one and all try to cultivate the power of pleasing; nothing is simpler or easier. It does not require any particular talents or any superhuman effort. It is not confined to any condition of life, nor is it dependent on any surrounding circumstances: all it demands is the presence of a sympathetic spirit; a willingness to be pleased, a desire to see the bright side of things and to discover the best points in people; a frankness and openness of disposition; a readiness to leave self and other diverting objects and to enter into subjects more acceptable. The benefits to be derived from the efforts expended on our parts in this direction are infinitely great—and far-reaching.

The art of remembering is a very potent factor which is well worth cultivating. Caesar never forgot anyone; Napoleon knew his soldiers by name; Daniel O'Connell was as much at home in the western counties of Ireland as in the House of Commons. Once he met a man he always knew him. There should be no more thoughtful man than the dentist. If he were more thoughtful much of the dentistry that is painful could be made painless. A great deal of pain may be eliminated in dental operations by the thoughtful dentist. I shall give you one concrete example, although the application holds good in numerous other ways. A patient presents himself for treatment—he has a large occlusal cavity in a lower molar. What do we invariably do? Insert a bur in the right angle, put it into the cavity, break down overhanging enamel, trim the margins, remove the decalcified dentine, perform "extension for prevention," and insert our undercuts; all this is done with the engine going at top speed, inflicting, as you are aware, much pain. The above is the method of the thoughtless dentist. Here is what the thoughtful dentist does: In the first place his

technique is correct, unlike the faulty technique of the thoughtless dentist; he breaks down his overhanging enamel margins with chisels and cutting instruments, trims his margins with stone in the right angle running at a slow speed; uses spoon excavators, sharp ones too, to remove the decalcified dentine, and finally uses his bur to obtain his undercuts; usually one or two sweeps of the bur will suffice. He completes his operation with very little pain to the patient, very often none, because he is thoughtful.

We as dentists should never allow our patients to dictate to us; nevertheless we should at all times respect the wishes of our patients, and I don't think we should be averse to listening to their suggestions. We shall likely do it our own way in the end, but oftentimes something may be gained from their suggestions which may be beneficially applied to the case in question. This is a case where we have to use our good judgment and power of discretion.

In our work we all have to deal with children. There was a time when the child of tender years was an unknown person to the dentist. The laity are becoming educated, and the child is being sent to the dentist; the number in the future will increase accordingly as the laity become better educated. The child invariably comes to us because he or she likes us. The pronounced personality of the dentist appeals to the child. There are qualities which the dentist possesses which the child likes in him; these qualities invariably are: kindness, sympathy and patience. If we possess these qualities we will undoubtedly have many little patients who will continue to be our patients when they gain maturity.

This may be a digression from my subject, but in order to show you how a personality of a dentist, or else a few qualities, that go to make up his personality, has an influence over his practice, in so far as his treatment and dealing with children are concerned.

I must unfold to you a few ideas gained from observance and a little experience in dealing with children in our work.

We should ever be kind, sympathetic and patient with them. We should always keep before our minds that our patient is only a child and we cannot expect as much from them as from a mature person. We should always learn and try to remember the child's Christian name. Never under any conditions should we deceive them; they will never forget it. Never tax their energies by long appointments and too long sittings in the chair. Never do any treatments for a child upon their first visit to your office; relieve the pain, if there be such, and spend the remainder of the time in becoming acquainted with the child.

There was a time when the world knew nothing about steam, except as a thin, useless vapor. It lay undiscovered and unused. So also did electricity, but now these have been discovered, tamed and harnessed.

So also among us, in our lives is a vast amount of unused power. We work as we think, and yet there are faculties that lie dormant

because the will never seized hold of them and brought them forth. Undoubtedly there are some of us who do not use more than one hemisphere of our brain at once and others of us who have a whole range of faculties undeveloped. We should ever endeavor to discover these faculties and not submit to a daily waste of power, but harness these faculties, develop them and make application with them to our chosen work.

Three things which we as dentists should strive for, *i.e.*, a trained mind, a skilled hand and a regulated heart.

Respect your profession; have your heart in your life's work; only when the heart loves can the intellect do the work. Be stout-hearted; do something; act always, and—do it now. Don't be afraid; many a man has been defeated by his doubts—lack of confidence. Take your risks—we cannot eliminate them; we cannot escape them; we can diminish them by dominating them.

Each one of us had a natural right to choose that vocation which he thought most likely to give him a comfortable subsistence: at the same time we, as professional men, should not allow our lives to be dominated by the dollar. It has been said that "money talks." It is well to allow it to talk a little, but we should not allow it to talk so loudly that our code of professional ethics may be driven into cold storage and allowed to remain there.

In this paper I have touched on a number of points dealing with the personality of the members of the dental profession, and my concessions are, that if the men in our profession will try and develop a pronounced personality somewhat along the lines which have been laid down in this paper, that their benefits to be derived are of a two-fold nature:

In the first place we are developing a personality, which is a host of greatness in itself. Secondly, while we are so developing it we shall become better dentists and better professional men.

We all know full well the frailty of human nature, but let us never be disheartened, but keep on striving, and we cannot help but get results eventually.

Whatever we do to so develop our personality we should do in all sincerity. We should not allow ourselves to do it in a hypocritical way, and from a mercenary standpoint, but let ourselves be dominated by the right principles, and our harvest will be abundant.

For the conclusion of this paper I quote "Walt Mason," the Poetic Philosopher, with all due apologies to Mason for the slight changes I have made. This is entitled "The Commercial Basis."

"Oh what are the things of particular worth? And what are the prizes we gain upon earth? They are not the gems that go clickety-clank; they are not the bundles we have in the bank; respect of our neighbors, the love of our friends, some credit up there where the firmament bends.

"These things are the guerdon for which we should strive; they give us an object in being alive; And you will never gain them; as gain them you might—unless you believe it pays to be right."

DISCUSSION.

DR. JOHNSON: I am sure the other gentlemen will join with me in thanking Dr. O'Neil for the very able paper he has just delivered, and no doubt we will be able to improve ourselves by following out some of his suggestions. Yes, as Dr. O'Neil says, personality is individuality, only a pleasing and strong personality is in many cases an individuality improved upon and developed, and I agree with Dr. O'Neil when he says "Develop the personality," or, as I would put it, "Develop the individuality until it becomes a personality."

There is one point in Dr. O'Neil's paper that I should like to make special mention of, that is, that a dentist should always have great cheerfulness. You all know a smile doesn't cost anything, and even if things do not always go right, and we know they never do in a dental office, why, smile anyway. It is not harder to look on the sunny side of things than to walk around the office with a grouch on, and, believe me, it means a lot to your practice.

You have all gone into a store or an office and been waited on in a way that made you think your business was not appreciated, and in fact it would almost seem that they would rather be without it. Well, gentlemen, that is just the effect that that grouch in the office has on your patients.

Another great point Dr. O'Neil speaks of is sympathy for your patient. Now I should like to give my own opinion on sympathy. It is all right if used right, always show it when working, but never let your patient play on that sympathy till you do not perform your operations faithfully. As Dr. O'Neil says about the amalgam filling, "do not slop things over" because of sympathy for your patient. That is only false sympathy and only making more pain and trouble for your patient afterwards.

Then about the personal appearance. Gentlemen, I do not think it is necessary to dress expensively, but I do think it is necessary to dress neatly, and never think you are saving anything by wearing dirty linen or a shabby suit or shabby shoes. Put on the clothes that will make your appearance pleasing, not loud, but neat, and it is a business getter. The same thing applies to the office. Your office, in order to be attractive to your patients, must have care. The more you care for your office and have it looked after the more confidence people will have in you. Dr. O'Neil speaks of the dictation of the patient. I think it is only common courtesy to listen to any suggestions that your patient may make, although you may not act on them, but it is well always to remember that it is the patient who is enabling you to make a living in the profession, and it is up to you to follow their wishes in any way you can, if you can do so and at the same time practise good dentistry. Then again, if their suggestions are not good to most people it is not a difficult matter to show them where they are wrong and at the same time work in your own way. Then, when you dismiss them they are satisfied. You

have taken them into your confidence, and they believe you have worked in their best interests to the best of your ability.

Another point I would like to mention here is about the kicker on fees. You do not need to make an enemy of him when he objects to a fee you have charged. Be what is called in a slang phrase "smooth" about it; explain that that is what the services you have rendered him are worth, but, above everything, be firm and never reduce the fee you have first asked, because if you do you are sure up against the "shopper" from that time on.

Another point I should like to mention here is, when washing the hands before commencing to work for any patient; wash them where that patient can see you. I remember when I was in college Dr. Webster said, "Get to the basin while your patient knows you are there, wash your hands, do a good deal of splashing about it, so that your patient will know you are particular about such things," and that is something I have always remembered and put in practice.

The same thing applies to sterilizing your instruments. I make it a practice of doing that where the patient can see me do it. Now these points may seem small, but they make an impression on your patient and he is bound to think that if a man is careful about these matters he is not going to be careless when working at the chair.

DR. BUSH: I must apologize for getting on my feet, but really when I saw Dr. O'Neil on the platform I thought he was just the exemplification of what was said by a certain preacher. This preacher had been criticized by some of his congregation. He said on the following Sunday that there had been some very unkind things said about him, but he was there to preach to them and they were to do as he told them and not as he did or else they would all go to hell. Now, gentlemen, Dr. O'Neil is just the reverse of that; he has evidently been taking his own medicine. When he stood on the platform there with that smile that won't come off evidently it was easy to see he had been studying in his own school. There have been schools for all sorts of things, and they are multiplying—schools for the training of memory, schools for this, that and the other, why not a school for the training of personality? After all many things can be improved upon by careful application, and I should think a good principal for that school would be our friend Dr. O'Neil.

There were many things that he said in that excellent paper that were very good indeed; in fact nearly everything was very good. Where he speaks of keeping your temper, I think that is one of the greatest assets a dentist can have. Keep your temper, or at least pretend to. Don't show it; hide it by a kindly smile. And it is sometimes rather difficult to keep your temper when, as Dr. O'Neil says, somebody calls you up at three o'clock in the morning or any other time that is not office hours, and you strain a point perhaps to relieve suffering, and then the patient calmly tells you he has been

suffering for four days when he called you up at this particular time forsooth to get relief. That is the time when you are to hide your loss of temper.

I am not going to take up much of your time. I only want to compliment Dr. O'Neil on his paper, and if I have any dentistry to be done I may go down to Fort William to have it done.

DR. ROGERS: I was very much pleased though with the paper and also with the leader of the discussion. Almost every leading thought brought out by the paper was very worthy our remembering. The paper was too long and too valuable in its suggestions to be covered in this way by a discussion on the spur of the moment. It is an easy matter for the dentist if his heart is in the right place to get the confidence of children, and once secured it is a great help.

DR. G. J. CLINT: I am very much pleased this morning with our opening paper. I congratulate the committee on securing this paper as an opening one. I congratulate the essayist on his effort. I think we can congratulate ourselves on having had the privilege of listening to this paper this morning. It has covered so much ground that I cannot follow it in detail and give it the attention that it deserves, but I certainly think that if it were not Monday we might imagine we had been in church this morning and had received a real good Christian sermon. The optimism of the essayist certainly should be contagious, and I hope it will be; I intend to make it so if possible.

I would like to congratulate him very heartily on the success with which the paper has been received by the Association. The rapt attention assures him of the fact that his paper will bring forth fruit.

DR. HARWOOD: I may say the West is full of optimism, Mr. President and gentlemen. I am glad I live in the West, because I am also full of optimism, both in regard to the profession first and in regard to the future of our country.

I might also touch on the mention he makes of sympathy towards your patients, and towards your little patients especially. My contention with regard to the children is that if you succeed in winning the confidence of the child that you not only have a patient practically for life, provided that patient and you remain in the same community, but you have also made a good patient for every other man who has that patient to deal with in after life. You know as well as I do that a child is very susceptible to the people with whom it is associated, and possibly more so with a dentist than the ordinary person, because the majority of parents and friends have the idea that going to the dentist's chair is like Hades, or worse, and if you can convince the child that it is not as bad as they make it out to be, and can amuse them for a little bit as well as do the work you are accomplishing more than the actual work you are doing.

DR. RIGGLES: A point that particularly struck me as well as some

others is the matter of personal habits, personal cleanliness, etc. That is a subject that sometimes persons are a little careful about touching on because we have our likes and dislikes. I will start out in that abrupt manner to explain what I mean. I have on my dental wall what perhaps no other dentist may have: "No smoking allowed here." Some have said to me, "Riggles, you are going to drive practice away from your office." I have said, "All right, we will see." To illustrate this, a Norwegian friend came in, Hans Holme by name. I undertook to operate on a molar. Every half-minute that man would have to stop and use the cuspidor; not that he was chewing tobacco or smoking, but he was a very hard smoker. I said to Mr. Holme, "I believe you have tobacco throat and you may have other ills with that; you better consult your physician." He asked me what the result was. I told him tobacco heart and some other things. I postponed his appointment, and he came back in two weeks and he said: "I consulted my doctor and he said I have tobacco heart." I will not have smoking in my office. I have lots of smokers in the West; it seems to me that every homesteader is a smoker, but I have been there a little over a year and I have increased my practice. The public schools are teaching the effects of this, and there are a lot of your patients that do not like to come into an office filled with tobacco smoke. I take a smoke once in a while, not very often, but I do not impose upon other people. I think this matter of personal cleanliness is something we want to consider.

DR. O'NEIL: Gentlemen, I haven't got very much to say in concluding, but I am very grateful to be here to-day, and I am very grateful for the way in which the paper has been received. When a man makes an effort to do a thing and sees that it has been received in a kindly manner it makes him feel good. I know there are older men who might have discussed this subject, but, nevertheless, if a man has observation he can sometimes, you know, make remarks to older men.

**Ontario Dental Society Meets in Toronto
May 31st, June 1 and 2, 1911**

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VOL. XXIII

TORONTO, MAY 15, 1911

No. 5

THE DENTAL SOCIETY OF WESTERN CANADA.

The Dental Society of Western Canada held its annual meeting in Winnipeg, April 24th and 25th, 1911. The attendance was large, the programme was excellent, and the dental exhibits remarkable. Above all, and in the forefront of everything, was organization enthusiasm and good-fellowship. The dentists of Western Canada are princes.

The invited guests of the society were: Thomas B. Hartzall, Minneapolis; W. E. Cummer, Toronto, Can., and A. E. Webster, Toronto, Can.. The President's address discussed real things, and Dr. O'Neil's paper would do credit to a philosopher.

A feature of the meeting was the organization of dental education of the public in Western Canada. Dr. Webster delivered a lecture in the Y. M. C. A. hall to an audience of six hundred of

the prominent educators and philanthropists of the city. Dr. Simpson, chairman of the Provincial Board of Health, acted as chairman. In closing the meeting, Dr. Simpson said that he looked forward to the time in the near future when there would be a dentist appointed in connection with the Public Schools of Winnipeg. He assured the dentists that all their efforts along this line would be seconded by the Board of Health.

At a meeting of the Dental Educational Committee, Dr. D. Norman Ross was elected chairman and W. F. Hamilton secretary. It will be the duty of this committee to stimulate the Dental Education movement by every possible means. The Canadian Oral Prophylactic Association will place in their hands charts, slides, models, literature for lectures to the public, to teachers, pupils and nurses. This material is to be sent to any dentist free of charge who wishes to do educational work in his home town.

It is the desire to as far as possible arrange to have the local dentists organize to do this work. It is a matter of home education with assistance from the central committee at Winnipeg. It is gratifying to know that in several towns in the West the Boards of Education are ready to co-operate with the dentists.

The banquet which brought the meeting to a close was held at the Royal Alexandra. Over a hundred sat down. The arrangements and the cuisine were a credit to the dinner committee and the hotel. It is impossible to give any idea of the enthusiasm and full-heartedness of the dental profession of Western Canada. It is worth a trip to Winnipeg from the East to meet the boys.

Dr. Summers, dentist, of New Liskeard, was awarded \$350 for illegal seizure for rent by the landlord.

Dr. Heath has opened a Dental office in Georgetown, Ont., in the same rooms recently occupied by Dr. McKinley.

Dr. Cummer and Dr. Webster, of Toronto, and Dr. Hartzell, of Minneapolis, were made honorary members of the Dental So-

ciety of Western Canada.

Dr. M. H. Garvin was re-elected President of the Dental Society of Western Canada.

Dr. J. A. Sanders, dentist, of Kemptville, has gone on a trip to Western Canada, and purposes settling in British Columbia in the near future.

Dr. S. Globensky, of Montreal, died Saturday, April 22nd, 1911.

Proceedings of Dental Societies

PROGRAMME OF THE ONTARIO DENTAL SOCIETY.

WEDNESDAY, MAY 31.

1.00 p. m.—Registration

2.30 p. m.—President's address and President's report.

3.00 p. m.—Report of Educational Committee.

Report of President of Board.

Business appointments of Nominating Committee.

Report of Miller Memorial Fund Committee.

3.00 p. m.—E. Paul, D.D.S., Toronto — "Anaesthetics and Extraction."

Discussion by Chester N. Abbott, London.

4.45 p. m.—F. L. Fossum, D.D.S., New York—"Removable and Semi-Removable Bridge Work."

Discussion, by A. W. Thornton, D.D.S., Toronto.

THURSDAY MORNING, JUNE 1.

9.00 a.m.—Clinics.

12.00 p. m.—W. J. Hill, D.D.S., Alliston—"Practical Methods in Orthodontia Short of the Ideal."

Discussion, by C.H. Juvet, D.D.S., Ottawa; R. G. McLaughlin, D.D.S., Toronto.

4.00 p. m.—Six Questions.

(1) How to treat Jussipient Alveolar Abscess.

(2) How to treat Facial Neuralgia.

(3) How to Bleach a Tooth, J. G. Roberts, D. D. S., Brampton, Ont.

Discussion by W.B. Amy, D.D.S., Toronto.

(4) How to Treat Erosion and Abrasions on Labial of Incisors, J. Frank Adams, D.D.S., Toronto.

(5) How to Prepare a Cavity in the Distal of a Bicuspoid, under specified conditions, A. E. Webster, D. D.S., Toronto.

Discussion by W. C. Gowan, of Peterboro.

(6) How to Treat a Punctured Root, Harold Clark, D.D.S., Toronto.

Discussion by C.E. Pearson, D.D.S., Toronto.

5.00 p.m.—Alveolar Osteoclasts, A. J. McDonagh, D.D.S., Toronto.

Discussion by C. E. Pearson, D.D.S., Toronto.

8.00 p. m.—Physics Building of Toronto University, Dr. Hordlitch, Anthropologist of the Smithsonian Institute of the United States National Museum of Washington, D. C.

Remarks, Mr. Connelley, University Museum, Toronto.

FRIDAY MORNING, JUNE 2.

9.00 to 12—Clinics.

A Golf game has been arranged over the Lambton Links. Members will bring golf clubs with them.

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TRANSACTIONS OF THE TWENTIETH ANNUAL CONVENTION OF DENTAL ASSOCIATION OF THE PROVINCE OF NOVA SCOTIA.

(Continued from April Number)

REPORT OF COMMITTEE ON EDUCATION OF THE PUBLIC AND SCHOOL CHILDREN.

Halifax, July 12, 1910.

To the Nova Scotia Dental Association.

Mr. President and Gentlemen:—Your committee on the Dental Education of the Public and School Children beg to report that during the year they have had considerable correspondence with the Canadian Oral and Prophylactic Association, the School Dentists Society of England, and other Societies and Individuals interested in this important matter in various parts of the world. Interviews have been held with the Educational authorities with regard to Lectures, Examination of school children's teeth, revision of school books, and publi-

RECENT GRADUATES OF THE ROYAL COLLEGE OF DENTAL SURGEONS.

Samuel George Alderson, Milton Taylor Armstrong, James Wesley Ault, Hector Charles Banford, Frederick Lorne Bass, Augustus Jasper Wolsley Brett, Roswell Morris Burgess, John Lionel Carroll, Ward Cunningham, Fred Lodge Downing, Harry Cifton Duffin, Wilbert Roy Eaman, Cameron Leroy Eaton, Wilbert Harold Gilroy, Ernest Arthur Higley, William S. Lackner, William James La Flamme, Lorne Reginald Macdougall, William Herbert McDonald, Herbert Boyd McKay, William Stanley Madill, Howard James Merkeley, Lloyd Alfred Moffatt, Hugh Arthur Mustard, Cecil Nicholson, Richard Ashmer Patterson, Beverley J. Patterson, Arthur M. Phillips, William Patrick Powers, Ralph Erskine Robertson, George Haycroft Ross, Matthew John Rudell, Fred Norval Sangster, Fred Llewellyn Schnur, Morris Schwartz, Harry Alexander Simmons, Chester John Smith, Oliver Campbell Spratt, Ralph Emerson Stone, Deans Elliott Taylor, Arthur Blake Wagg, Harry Wilson, John Orr Wilson, Charles Edward Wright, Joseph Elmer Wright.

cation and distribution of pamphlets.

Revision of School Books.

A copy of the revised Ontario text book on Hygiene for young people was received, and the Superintendent of Education has promised us an early opportunity of supplying matter on Oral Hygiene for the revised Nova Scotia text book.

Publication and Distribution of Pamphlets.

Your committee discussed this matter with the Halifax Dental Society, and were appointed and requested by that body, to complete a pamphlet suitable for distribution to school children, but after careful consideration of the scheme, it was decided to accept the offer of the C.O. and P.A.



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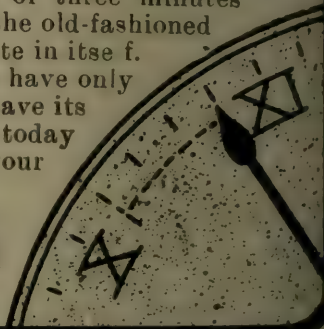
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to supply us with pamphlets for distribution to prominent professional and business men and women throughout the province. The Superintendent of Education, who with the supervisor of the Halifax City Schools, is very much interested in this work, has suggested that a reprint of these pamphlets might be published in the Journal of Education, and thus reach every school teacher in the province.

Lectures and Examination of School Children.

The supervisor has requested us to resume the examination of the children's teeth, to be followed by short lectures on the "Care of The Teeth". The members of the Halifax Dental Society are dental examiners in the Halifax Schools, and are now at work on five minute sample lectures for this purpose. Notices of Dr. Bryce's lecture before the Antituberculosis Society and school teachers of the city were sent to all the Halifax dentists—Drs. Frank Woodbury and Geo. K. Thomson represented the dental profession on this occasion, and during the discussion Dr. Frank Woodbury informed the audience of the importance of Oral Prophylaxis and the work our Association is doing, his remarks being much appreciated.

Your committee have made suggestions to the C.O. and P.A. which have been very kindly received. Both the C.O.P.A. and Ontario Dental Society are conducting a great educational campaign in Ontario and their reports to the C. D. A. published in the Canadian Dental Journals, are recommended for your consideration.

Hutax Brushes and Preparations.

The Hutax paste and powder, which, owing to the very large demand and small supply, have been difficult to obtain at times, are now manufactured by Messrs. Hyman Bros., Montreal, and the druggist should have no difficulty in filling prescriptions for them. It is very desirable that you prescribe these brushes and preparations for your patients. The present form of R blanks (one of the suggestions of your committee) are very convenient and easily

completed without loss of time. They can be obtained free from the Secretary, Dr. A. J. Broughton, Toronto.

The School Dentists Society of England are much interested in our educational campaign in Canada, and have done us the honor of electing one of our members, Dr. Thomson, an honorary member of their Society. They send him copies of their transactions and information with regard to their work that it may be easily available for Canadians who desire it. Your Committee have also recommended to Insurance Companies the issue of a bulletin on Oral Prophylaxis by their health Bureau. Two years ago, a public dental educational campaign was begun in Sydney, C.B., consisting of the examination of school children's teeth, followed by short lectures. Last year the examination was postponed until 1910. With the exception of Halifax and Sydney, no systematic educational work has been done. Your committee recommend the appointment of one member in each of the following towns: North Sydney, Sydney, Yarmouth, Windsor, Truro, Amherst, New Glasgow, Glace Bay, to organize local committees for the purpose of carrying on this campaign.

A resolution was made authorizing your committee to obtain legislation for the establishment of a free clinic to care for the teeth of the poor in the city of Halifax.

An arrangement has been made with the Antituberculosis League so that oral prophylaxis may be taught in connection with their work at the Provincial Exhibition and elsewhere.

Revision of N. S. School text books on Hygiene Publication and distribution throughout the Province of pamphlets on the care of the teeth is recommended by your committee.

Respectfully submitted,
(Sgd.) Geo. K. Thomson.
S. G. Ritchie,
H. Woodbury.

On motion this report was received for discussion, and was commented upon with much interest by many of the members and finally adopted.

Moved by Dr. F. Woodbury, seconded by Dr. Black, that this report be printed and

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distributed for publication in the local and educational journals of the Province; and that copies be sent to School Trustees, members of the Medical Profession, Clergymen, Officials of the Anti-Tuberculosis League and distributed in any other way that seems advisable. To carry on this work, members of the Dental Profession in different towns in the Province shall be appointed to constitute a board. Carried.

The following appointments were made: Dr. Burchell, North Sydney; Dr. Black, Sydney; Dr. O'Brien, Amherst; Dr. Langille, Truro; Dr. Dimock, Windsor; Dr. Harding, Yarmouth, Dr. Wright, New Glasgow; Dr. Mitchener, Mahone Bay; Dr. Goodwin, Glace Bay; Dr. Roach, Wolfville; Dr. Douglas, Westville and Stellarton; Dr. Harrington, Bridgewater.

The Reverend John Forrest, L. L. D., President of Dalhousie University, was introduced to the Association by Dr. H. Woodbury.

Dr. Forrest gave a very interesting address, relating principally to the future of Dalhousie and the Maritime Dental College. A hearty vote of thanks was tendered to Dr. Forrest for his address.

REPORT ON PRESIDENT'S ADDRESS.

Halifax, July 15, 1910.

Gentlemen of the N. S. Dental Association:—Your Committee having examined the President's address, beg to report favorably of the address as a whole, which should be accepted by the Association in session.

There are two matters considered in the address that should be subjects of discussion and steps taken as may be deemed necessary to give effect to such decisions as may be arrived at after careful deliberation.

1st. The matter of the inspection of school children's teeth, and the having proper inspectors appointed throughout the Province.

2nd. The matter of the advertising dentist, and "Ways and Means to check the growing evil."

Another matter that the President has called to our attention should be the subject of careful consideration. We refer to the necessity of a more general interest in this Association. The lack of interest is manifested in the comparatively small at-

The reference to the Maritime Dental College contains the timely suggestion that it should have the hearty support of all the members of the Association of which we approve.

Respectfully submitted,

F. W. Wright.

H. W. Burchell.

B. L. Neiley.

On motion this report was received, and was the subject of considerable discussion. Drs. Wright, Douglas and Thomson were appointed a committee to consider the questions involved, and report at the evening's meeting.

The following papers were read and discussed.

Dental Fees. Dr. Oxner.

Modern Dental Surgery. Dr. Thomson.

The Legitimate Field of the Silicate Cements. Dr. Ritchie.

Meeting adjourned.

8.15 P. M.

The discussion of Dr. Ritchie's paper was resumed, and Dr. Eaton, of India, and Drs. Partridge and Gormley, representatives of the exhibiting Dental Manufacturers, were given the privilege of the floor.

Dr. Beckwith read a paper entitled Ethyl-Chlorid as a Local Application in Excavating Cavities.

Dr. F. Woodbury gave an address on Things Seen and Heard in Toronto.

On motion the report on the President's Address was adopted.

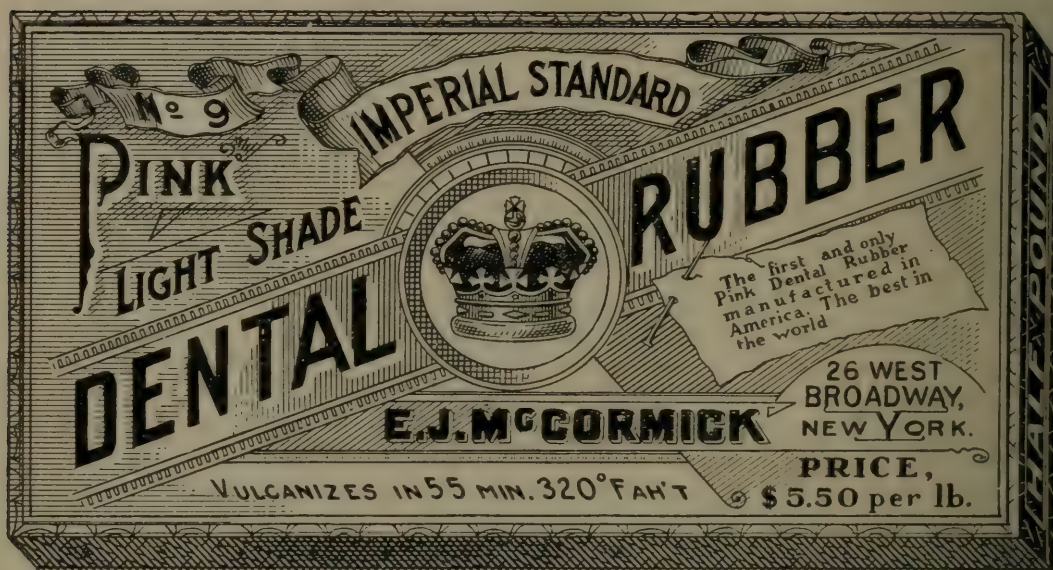
Dr. Wright extended an invitation from the dentists of New Glasgow to the effect that that town be chosen as the place of the next annual meeting.

Moved by Dr. F. Woodbury, seconded by Dr. Fluck, that this invitation be accepted. Carried.

Moved by Dr. T. F. Macdonald, of Truro, seconded by Dr. Loomer, Canning, that a vote of thanks be tendered to the Halifax dentists and the ladies who took part in the entertainment of the visitors. Dr. Fluck replied in behalf of the local entertainment committee. The secretary was instructed to send a copy of the resolution to the ladies whose good work was so largely instrumental in making the picnic a success.

Meeting adjourned.

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20—White Rubber.....	5 50	5 00	4 75	4 50
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WHAT THE PRESS SAYS IS BEING DONE IN CANADA FOR ORAL HYGIENE.

After a lecture on oral hygiene by G. K. Thomson, Halifax, the Anti-Tuberculosis league passed the following resolution :

It was moved by Major Chisholm and seconded by Mr. J. T. Fraser that —

"The Anti-Tuberculosis League appreciate the importance of oral hygiene in the prevention of Tuberculosis and other diseases and recommends the establishment in Halifax of a free dental clinic for education in mouth hygiene and treatment of the teeth of the worthy poor."

The resolution was passed unanimously.

Cranbrook Herald says :—For some time past Dr. Connolly, the public school medical health officer, has been engaged in a careful medical examination of all the pupils attending the public schools in this city. The results of his examination are somewhat alarming and call for earnest consideration on the part of the school trustees and parents generally. Dr. Connolly has found that a very large percentage of the older pupils are troubled with defective eyesight, and that a equally large, if not larger, percentage of children in the lower grades are troubled with defective teeth. This is state of affairs that should give rise to thought and action. Defective eyesight is a serious hindrance to most young people, entirely barring them from certain occupations and placing a handicap on their progress in almost any avocation. Defective teeth are the forerunners of many ills that flesh is heir to. In the case of the teeth it is believed that too liberal indulgence in candies and the pernicious gum chewing habit are the direct cause of the conditions found to exist. Why so many of our youngsters should be troubled with defective eyesight, is a greater problem, but the cause should not be hard to locate and parents should unite with the school authorities in vigorously combating both these evils.

The Brockville Times says :—"Next to these mouth washes a correct method of brushing will do much towards preservation," he continued. "Rubbing the brush to and fro only polishes the middle of the surface, just as the nails would be affected if a woman rubbed her chamois buffet over

the top only. I notice some women turn their fingers sidewise when they polish them, so that every part of the nail may be made to shine. She can't turn her teeth naturally, but what she can do, and so can other women, is to adapt the brush to the teeth. The brush should be held across the teeth and placed at the top of the gums at the upper jaw. Then the bristles must be drawn down to the bottom of the teeth, following the space beginning at the gum and drawing the brush up toward the top. Chances are that particles will be eliminated ; in any event the edges of the teeth —have been cleared."

The Owen Sound Herald says, editorially —"The request of a grant made to the Board of Control in Toronto last week, for the purpose of maintaining a free dental station for the care of school children whose parents are poor, has given rise to a great deal of discussion —the greater part of it being highly commendatory. A large deputation of prominent men waited upon the Board with the request that the city pay for a station with six chairs, six practitioners and two nurses, and, that these furnish free dentistry to pupils whom the dental inspector of the Board of Education reports in need of it. The cost to the city would be about \$15,000 a year, while the cost of fitting up the station which it was suggested should be central, and preferably in the city hall would be contributed by private subscription. The deputation was asked to outline its scheme in a letter and was promised careful consideration.

Toronto will perhaps adopt this scheme. It is to be hoped that it will, and at the same time, it is also to be regretted that every town cannot do likewise. Free dental parlors are now almost necessary, and should, if possible, be established. The Inspector has shown in his report, the fearful condition of some children's teeth, and his report has not been at all exaggerated. There are some parents who cannot afford to pay dental bills. It is only by continual scraping and saving that they are enabled to send their children to school, and at the

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same time keep them comfortably and decently dressed. Bills for dentistry never enter into their calculations at all, and in consequence the teeth of their children are shamefully neglected. From one year to another there is never a brush put near them, so that by the time the youngsters reach their tenth or eleventh year, their teeth have been completely rotted and decayed. This is detrimental also to the health of the children, yet the parents are not to blame. They have not money to pay the dentist, and as the latter does not work for nothing, there is only one way to protect the children, and that is by the maintenance of free dental parlors, which, it is to be hoped, will soon be featured."

(Calgary News says editorially—"Toronto's experience should be a guide to Calgary's health department. This city should fall in line immediately. Other cities have. Movement toward dental inspection have been inaugurated in most cities. Edmonton physicians and dentists are co-operating and carrying on a good work. Good teeth mean good health; good health means a strong mind, and a strong mind means good citizenship. Poor teeth mean exactly the opposite. Do something."

Portage La Prairie Gazette says editorially—"The local dentists who attended the convention in Winnipeg have returned, and are enthusiastic over the success of the association's work for the year. This year's gathering was the most successful in the history of the society, both in the matter of attendance and in the various papers read, and addresses and demonstrations given. Pres. M.H. Garvin, who was re-elected, expressed himself at greatly gratified at the success, which has attended the sessions, and he stated that he felt sure that every member would look forward to next year's meeting.

A great point that was brought out was the necessity of public education along the lines of prevention. "Cure the disease if it exists," said Dr. Hartzell in an address, "but prevent it if you can."

He explained the great opportunities open to the dental profession for the enlightenment of the public concerning the importance of hygiene and prophylactic treatment.

as a preventative of disease. He expressed a hope that something might be done by the convention toward appointing a committee to undertake some original research work and make report at the meeting in 1912.

Dr. Webster's public lecture in the Y.M.C.A. on Monday evening was a great success. The large hall was well filled with a non-professional audience from the city. The lecture was illustrated by stereopticon views.

It will be interesting to Portagers to know that provision was made at the convention to supply material for lectures and lantern slides for illustration to any dentists in the province wishing to take up the matter of public education. Following the recent letter of the dentists to the school board, the local dentists will give lectures here shortly. The profession is now completing arrangements to take up the work.

Winnipeg Free Press says:—"Hygiene of the mouth" was the subject of an interesting and instructive lecture by Dr. A. E. Webster, of Toronto, in the hall of the Y.M.C.A. last evening, and it was attended by an overflow audience among which there were many teachers from the city schools. The lecturer made his points more plain by the use of lantern slides which depicted many of the ailments of the mouth and teeth which were endured, and in many cases entirely neglected. He pointed out that while parliaments spoke on the national aspect of minerals, timber and lands as an asset, and the conservation commissions acted purely on these lines, the army and navy of Great Britain, of the United States, of Germany, of France and Canada gave a natural recognition of value of dentistry as one of the chief tests made of a recruit was as to the condition of his teeth. He advocated the education of the people for self protection both mental and physical in the matter of the cleanliness of the mouth. He spoke of the state recognition of asylums, hospitals, etc., of the parent's responsibility as to example and then instruction, and then strongly pointed out that the chief factor in shaping of a future was the care of the mouth.

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" "B" (Dark Shade).....	5.50	5.25	5.00
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" "D" (Very Light Shade)	5.50	5.25	5.00
" "E" ("Nature's Gum")	5.50	5.25	5.00
" "F" ("Nature's Gum Light")	5.50	5.25	5.00
" "G" ("Nature's Gum" Extra Light).....	5.50	5.25	5.00
" Soft for Tender Gums, Etc.....	5.50	5.25	5.00

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Pink, Extra Strong	\$4.25	\$4.00
"Hercules" (Light).....	3.75	3.50
" (Dark).....	3.75	3.50
White	4.25	4.00
Extra Dense or Solid.....	3.75	3.50
Brown.....	2.75	2.45
Orange	2.75	2.45
Orange (Light)	2.75	2.45
Maroon	3.25	3.00
Red	2.75	2.45
* Black (Jet).....	3.75	3.45
* Black (Horn Color)	3.75	3.45
Padding or Core (to prevent porosity in very thick cases).....	4.00	3.75
Red, Soft for Tender Palates, Etc.	3.25	3.00
Vela, for Obturators, Etc., (Brown).....	5.50	5.25
Amalgamated Light Brown	3.75	3.50
" Dark Brown	3.75	3.50
" Black	3.75	3.50

*Corrections of previous mis-printed prices.

"But," continued Dr. Webster, "in the care of the mouth people not understanding that the condition of the teeth in decay leads to the destruction of the vital energies, both mentally and physically, and tends to make the victim of carelessness less able to resist the attack of insidious disease.

"Particular attention should be paid to the child in the growing stage, as when building up tissue the human needs all the strength possible to come to average strength, while neglect of the teeth means peevishness and lessened improvement in physical development. It is here that many parents show their carelessness by not paying attention to the ailments.

"The importance of the question," the lecturer continued, "can be gathered from the fact that there is a medical man from Birmingham, England, now making a tour of schools in Ontario emphasizing this question, and in New York State there are two medical men doing nothing else but lecturing on the subject."

"The lecturer then went on to make a deduction that the condition of the mouth was most important to the welfare of mankind. Care of the teeth and proper attention to cleanliness lead to health. He did not advocate any remedies except nature's own, and said once the eyes of the people were open, they would attend to themselves, and this was the object of the lectures. This lecture was the closing session of the first day of the dentists' convention now in progress. The morning and afternoon sessions were devoted to papers on technical subjects of professional interest, by Dr. T. B. Hartzell, of Minneapolis, and Dr. W. E. Cummer, of Toronto. The election of officers will be held to-day, and the final session will be divided between a theatre party and a banquet to-night.

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CITY COUNCIL OF TORONTO TO ESTABLISH FREE DENTAL CLINIC

A large deputation waited upon the Board of Control to request a grant to maintain a free dental station for the care of school children whose parents were poor. They requested that the city pay for a station with six chairs, six practitioners and two nurses, and furnish free dentistry to pupils whom the dental inspector of the Board of Education reports in need of it. The cost to the city would be about \$15,000 a year. The cost of fitting up the station, which it was suggested, should be central, and preferably in the city hall, will be contributed by private subscriptions. Among those who have promised to support it are: J. W. Flavelle, Cawthra Mulock, John C. Eaton and Sir Henry Pellatt.

The deputation was asked to outline the scheme in a letter, and was promised careful consideration. The spokesmen were: A.

C. Lewis, of the Board of Education; Dr. McLaughlin for the Ontario Dental Society; and J. T. Loftus, for the Separate School Board. The others in attendance were: Dr. R. J. Reade, editor Dental Pradist; Dr. Wilmott, dean of Dental Faculty of University of Toronto; Dr. Wallace Secombe, representative directors of Dental College; Dr. F. J. Conboy, and Dr. Alex. McKay, John T. Loftus and Dr. A. Carey, representing the Separate School Board; Miss Forsyth, representing the Evangelia Settlement; Samuel Arnold, secretary of Associated Charities; Dr. John Ferguson, representing the Western Hospital; Mr. Van Norman and John Duncan, representing the Children's Aid Society; and Ald. Yeomans, Dr. Doherty, dental inspector of public schools.

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A PERMANENT DEFENSIVE ORGANIZATION IS NECESSARY TO ASCERTAIN AND SAFEGUARD THE COMMON RIGHTS OF THE DENTAL PROFESSION.

The Dental Protective Association was formed and collected funds for the purpose of testing the validity of dental patents, but has recently so changed its by-laws and strayed from its original purpose as to become the ally and collecting agency of a patentee, whose test suit against the profession has been prolonged over the last three years; the patentee in the meantime securing two new patents to strengthen the claims of the original.

It was the patentee's own choice to apply the rigor of the law rather than an amicable and businesslike proposition to the profession. A defence committee was therefore organized, and its work so successfully performed that there is every reason to believe the original Taggart patent will soon be decided in favor of the profession. But Dr. Taggart's attorney has recently announced the probable institution of suits against many dentists under the claims of the new patents whose validity each individual sued would have to bear the expense of testing in the courts unless we create a dependable permanent defensive organization.

The object of such organization should be safeguarded by proper limitations on the policy and powers of its managing officers. For instance, there should be no concentration of authority as Dr. Crouse exercises in the voting of all proxies not otherwise assigned whereby he was enabled to change the policy and the law of the Dental Protective Association without the knowledge of the membership or an opportunity for their enforcing a protest. Neither should there be such authority to any three men as is granted to the board of directors of the Dental Protective Association whereby the board can change the law and policy of the organization on a week's notice to itself. Neither should any three men have such extraordinary power as was exercised by the board of directors of the Dental Protective Association whereby there was adopted an agreement previously arranged between Dr. Crouse and Dr. Taggart, provid-

ing that "no member of the Association is to defend or join in or contribute to the defence of any suit upon any of said patents while practicing the method under such permission from Dr. Taggart."

By this partnership agreement the Dental Protective Association acquires 40 per cent. and Dr. Taggart 60 per cent. of the money collected through this agency. Many consider this alliance more dangerous to the independence and safety of the profession than was the patent situation which threatened to enslave the profession but a few years ago. To say the least, it would be unwise, unsafe, inexcusable and insanely foolish for us to rest in idle indifference while organized effort, backed by capital, seeks to tie the hands of one after another of us until the profession loses its virility its independence, and its community of interest.

We as a profession have had the benefit of the course pursued for three years by the defence committee in the Taggart-Boynton suit, and a permanent defensive organization may utilize the information, the experience and the data accumulated, and this defence committee, of which Dr. M. F. Finley, of Washington, D.C., is chairman, and its contributing supporters, will be utilized as a nucleus of value in every respect. It seems to us the part of wisdom and sane self-protection to organize, and that ordinary prudence demands, and the vast interests of the profession require the most prompt canvassing and quick response possible.

The undersigned therefore invite every reader of this to join in a thorough canvas of the whole profession, and enlist as members of a new permanent organization every one whose personal interest and loyalty to the profession keeps alive his sense of justice and fraternity.

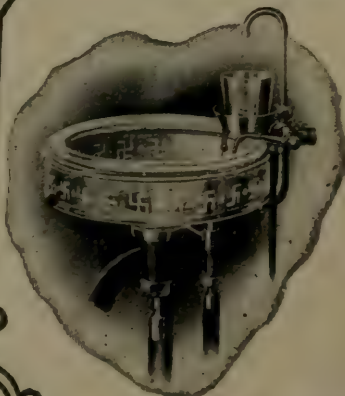
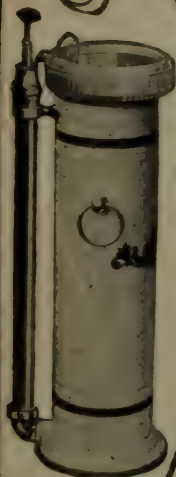
In this crisis let not the stigma of injustice or of disloyalty rest upon any member of the profession.

M. F. Finley, E. P. Dameron, A. J. Cottrell, R. Summa, H. L. Wheeler, C. W. Rod-



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gers, W. E. Boardman, F. W. Stiff, C. S. Butler, Wm. Donnally, E. E. Haverstick, H. C. Pelton, W. H. Trueman, F. A. Roe, S. H. Voyles, Wm. Carr, F. T. Breene, G. H. Wilson, V. E. Turner, I. A. Bass, R. H. Volland, W. G. Crandall, H. L. Roberts. Response should be addressed to Dr. M. F. Finley, 1926 "Eye" St., N.W., Washington, D. C.

WESTMORLAND DENTAL SOCIETY.

At the first regular meeting of the Westmorland Dental Society held in the Board of Trade rooms last evening officers were elected :—

Dr. L. H. Somers, President.
Dr. H. S. Thomson, Vice-President.
Dr. P. J. Gallagher, Sec.-Treas.

The meeting then discussed the question of oral hygiene in the public schools which matter has been brought before the school board by the chairman more than once, and discussed by the trustees. So far as the School Board is concerned the subject is by

no means a new one, though one of the speakers at the Dentist's meeting seemed to think it would be like a new revelation to the trustees.

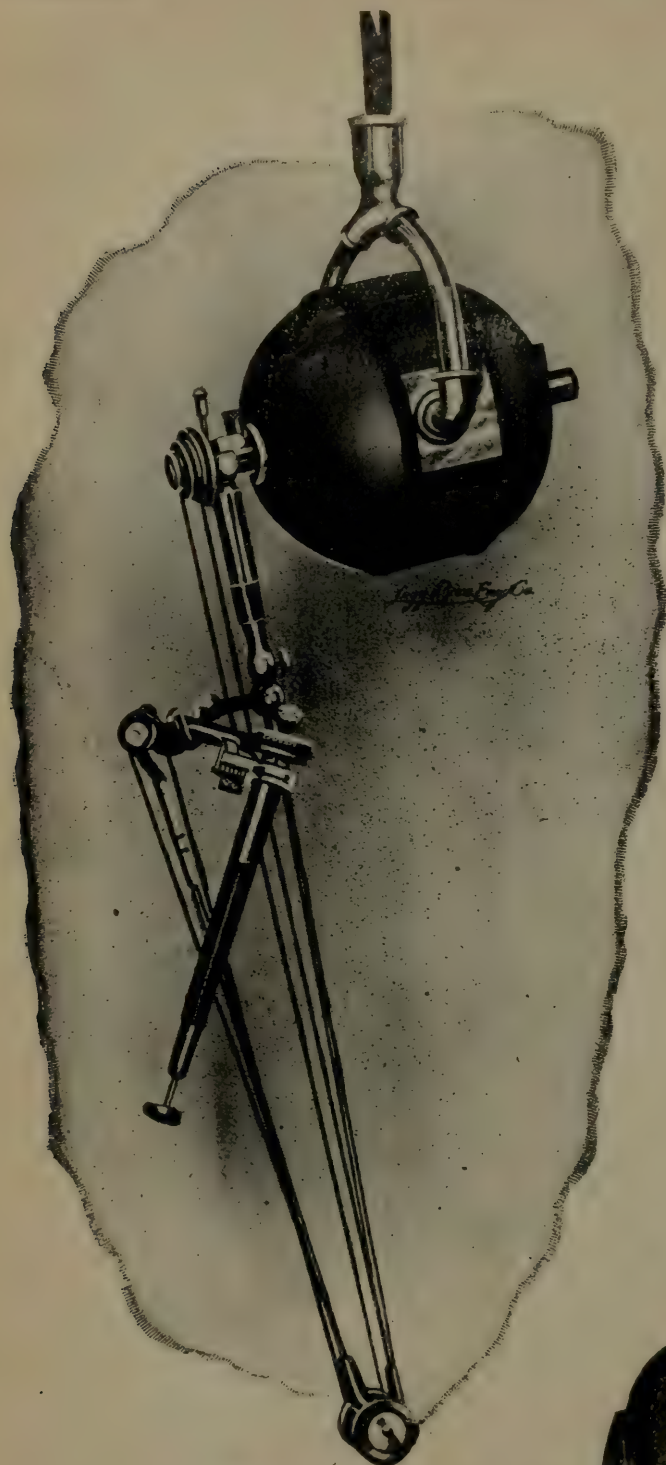
The very plan contemplated by the newly formed Dentist Society was long ago suggested to and discussed by the School Board and it has been awaiting for some practical suggestions from the dentists of the city.

The Dental Society appointed a committee to bring the matter before the Board.

The committee is composed of Drs. Murray, Gallagher and Price.

The Practitioners' course will be conducted at the Royal College of Dental Surgeons, August 29th, ending Sept. 10th.

The Royal College of Dental Surgeons will be open this summer for the first time. Dr. A. A. Stewart and Dr. B. O. Fife in charge. About twenty-five of the 2nd and 3rd year students have availed themselves of this opportunity.



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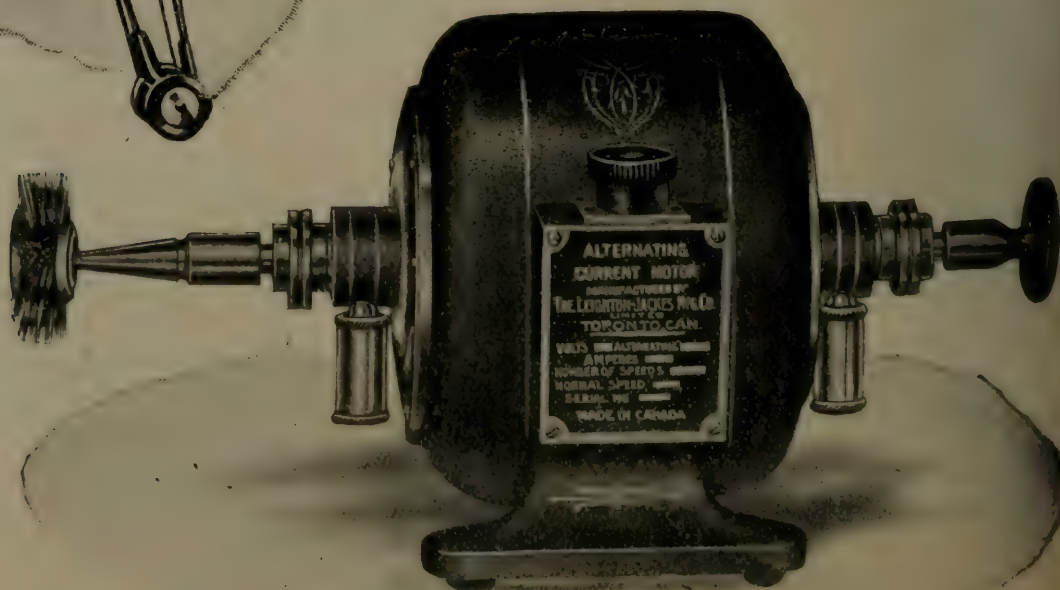
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IDENTIFIED BY DENTAL WORK.

Dover, N.J., April 21.—A dental bridge found in a room in a Brooklyn lodging house that had been occupied by a man who killed himself here two years ago, has just served to identify the body. A dentist in Stockholm, Sweden, to which the bridge was sent by the Swedish consul in New York, recognized it as a piece of work done for Berent Edward Collander, son of a wealthy cotton manufacturer of Stockholm. A representative of the Swedish consulate had the body exhumed this week and clinched the identification by locating a small scar described by the dentist. Collander's relatives say that he left Stockholm with \$60,000 in cash. It is suspected that he may have been robbed.

WHAT MAY THE PATIENT REASONABLY EXPECT OF ARTIFICIAL TEETH.

Says Mrs. A, "there is Mrs. B, has a set of teeth that she can do anything with, and she never has the least trouble with them; why can't I have the same success with mine?"

Simply because you have not Mrs. B.'s mouth. There is just as much difference in the shape and condition of mouths as in the face. There is the flat and the deep palate, the hard and the soft palate, the broad and the narrow ridge. The relative position of the two jaws has much to do with the usefulness of artificial teeth, especially if a portion of the natural teeth are remaining.

Lower sets are more troublesome than upper, and the mucous membrane of the lower jaw is apt to be more sensitive, especially when the ridge is very thin, or where it has nearly all disappeared from undue absorption of the bone.

In partial sets, plates with only front teeth are always more difficult to use than those with side teeth, unless in case clasps are worn.

But always bear in mind it does not follow that because your neighbor's teeth are a complete success in all respects, yours must necessarily be equally so. In your case, in consequence of unfavorable condi-

tions, more time and patience may be required to become accustomed to them.

Where the patients say they "forget they have artificial teeth," they are the exceptions to the general rule.

There are no cases, however, where a set or part of a set of artificial teeth may not be worn with comfort and a good degree of usefulness."

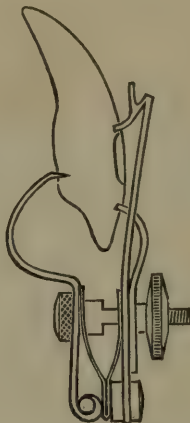
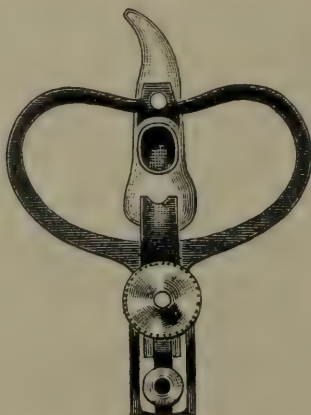
A STARTLING STATEMENT.

It has been said by those who have investigated the matter carefully that, although at the age of 45 fully 80 per cent. of men are established in whatever pursuit they follow, and are in receipt of incomes in excess of their expenditure, at the age of 60 it has been found that 95 per cent. are dependent upon their daily earnings, or upon their children for support. Many, no doubt, read the despatch from Detroit which recently appeared in the Canadian papers, and which described the condition of a man who but a little more than forty years ago, was a "financial power" in that city, who had a "palatial home" on one of the most fashionable thoroughfares, entertained lavishly, and to whom every person, high and low, was prepared to pay homage. But the fates were against him. He suffered serious financial losses, and when he began to go down hill he found it was properly greased for the occasion. His friends deserted him like rats from a sinking ship, and now at 80 years of age, after his day's labor, he wends his way to the city with the bent, broken down old men who have influence enough to have their names on the city's pay roll.

The moral is that out of your abundance something should be laid aside for declining years, and invested where thieves cannot reach it, and where one cannot be deprived of it in any possible way. This means is afforded you under the Canadian Government Annuities Act which the Parliament of Canada passed in the Session, 1908, and which received the unanimous support of both sides of the House.

You may get all information by applying at the Post Office, or by addressing the Superintendent of Annuities, Ottawa.

Cervical Clamp No. 25 A.

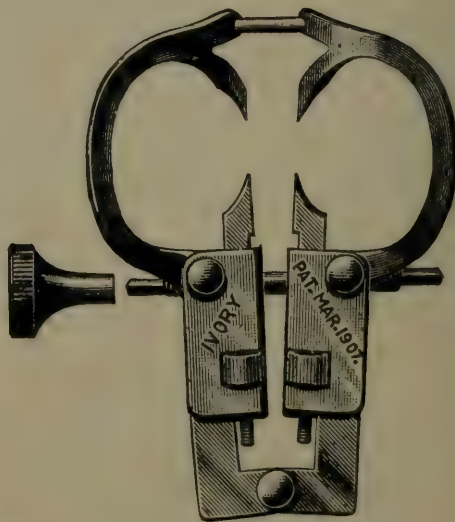
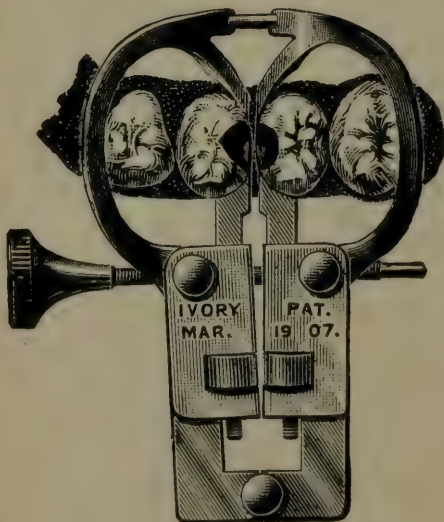


This Clamp is designed for superior incisors and is readily manipulated.

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THE INTERNATIONAL MILLER MEMORIAL FUND.

Since the last meeting of the Canadian Dental Association held in Toronto last June, the work in connection with the International Miller Memorial Fund has been in active progress. On account of the large territory to cover it has taken a longer time to prepare the preliminary lists for publication than was anticipated. This list will contain the names of all subscribers to the fund. The lists will then be distributed to every dentist, together with an account of the use to which this fund is to be put. The members of the profession will then be given one more opportunity of subscribing to this worthy cause. The final list will then be prepared. The movement has been a great success. Up to date the sum of \$970 has been subscribed. The lists will show how the different localities have responded.

THE CARE OF CHILDREN'S TEETH.

The Women's Imperial Health Association whose caravan campaign recently attracted a good deal of attention, has arranged a decidedly novel function in connection with its work. In its efforts to spread knowledge of the rules of health, especially in the rural districts, the agents of the Association have been impressed by the neglect of teeth in children. As the outcome of a lecture on this subject a lady in the Newbury district offered two prizes to the children whose teeth showed the greatest care and attention. No fewer than seventy children have entered for this novel development of the familiar "Beauty Competition," and it is to be decided in the village school-room at Wickham, near Newbury. An eminent dental surgeon of Harley Street, who is a member of the Executive Council of the Association, has consented to be examiner and adjudicator. It is hoped that this novel function may encourage the holding of similar competitions in other districts.

ECSTASY IN A WELL-CHEWED BEAN.

In an extemporaneous lecture brimful of epigrams and of the wisdom following

years of experimentation in nutrition, Mr. Horace Fletcher described in the language of a poet inspired for the occasion the ecstasy he encountered in masticating a half ounce of beans at the end of a seven-day fast. "It was in Chicago that I started my study of nutrition thirteen years ago," said Fletcher. "Then I was a business man, broken down in health, and had been denied life insurance by pessimistic physicians. To-day, at 61, I am hounded by solicitors, who offer me reductions in insurance premiums. Fletcherism means eternal chewing—chewing until the food swallows itself. Every mouthful should be chewed until the last vestige of taste has departed. An experiment will prove that it is not a task to practice my system. It will be found that the simpler foods, bread and butter and potatoes, lend more enjoyment to the palate when Fletcherized than the most highly seasoned concoctions. Before the taste of each morsel has gone the palate will have experienced sweetness beyond the wildest dream of a confectioner. As a matter of fact, Fletcherism is so simple it is ridiculous. The only thing necessary to be a Fletcherite is to have a good set of teeth and a willingness to give the system a fair chance. The only thing that need not be Fletcherized is water, which has no taste. Last August I began an investigation of the psychology of appetite. I had arrived at a stage where I had no desire for food and I started to fast. For seven days I took no food. Even at the end of that period I had no appetite. It was the plebeian bean with which I broke the fast. I ordered the beans 24 hours in advance and waited without particular interest until they were ready. They were served in the dish in which they had been baked. I took off the napkin and the steam wafted the appetizing odors to my nostrils. Still I had no desire to eat. Then, for the sake of experiment, I placed a bean in my mouth, and crushed it. Instantly subtle fumes ascended. My head and body seemed permeated with an ecstatic happiness. I shewed the bean and swallowed it. Then I ate a half ounce more. I did not eat again for twenty-four hours."—Chicago Inter Ocean.

DENTINOL

(Applied by the Dentist).

PYORRHOCIDE

(Used by the Patient.)

Pyorrhea Can Be Cured-- Loose Teeth can be Tightened!

WE PROVE our claims TO THE PROFESSION.

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Our Free Pyorrhea Clinic at Chicago, Ill.

THESE FREE PYORRHEA CLINICS are for the benefit of the PROFESSION ONLY and are conducted by us in the principal cities of the United States.

N.B.—OUR CLINICIANS will treat 60 CASES OF PYORRHEA for the four weeks prior to the NATIONAL MEETING IN CLEVELAND and show the results at our exhibit.

All cases treated must be presented by dentists.

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Reviews

Haskell's Manual of Plate Work or Hand-Book for the Dental Laboratory, by Loomis P. Haskell, D.D.S., formerly member of the Faculty of the Chicago College of Dentistry, later of the Northwestern Dental College, Organizer of the Haskell Post-Graduate School of Prosthetic Dentistry. Professor Emeritus of State Dental College of Texas. Sixty-five years experience in the specialty of plate-work. Revised edition. The only work devoted to plate-work ever published. Chicago, Ill., 1910.

The Business Problems of a Profession, by Frederick Crosby Brush, D.D.S., founder and fellow of the New York Institute of Dental Technique; member of the National Dental Association, the first District Dental Society, State of New York, the New York Odontological Society, the New York Institute of Stomatology, Psi Omega Fraternity, etc. New York, N.Y., The Press of the Dental Digest 1911. The dentist who does not read this book misses one of the most essential parts of the practice of Dentistry. It is readable, entertaining, useful, and convincing. Ask your dealer for it.

"AROUND THE WORLD DENTISTRY," by Henry Lovejoy Ambler, M.S., D.D.S., M.D., D.H., author of "Tin, Foil and its Combinations for Filling Teeth," "Facts, Fads and Fancies About Teeth," "History of the Northern Ohio Dental Association." Member of the National Dental Association, Ohio State Dental Society, Northern Ohio Dental Association, and Cleveland City Dental Society. In preparation, History of Dentistry in

Cleveland, Ohio. Illustrations by the Author. Cleveland, Ohio. The Judson Printing Co., 1910.

This is a book of less than fifty pages, which gives a racy picture of the practice of Dentistry in Italy, Greece, Palestine, Turkey, India, China, Japan, Australia, Phillipine Islands. The illustrations are particularly interesting.

SOMETHING ABOUT THE HASKELL FUND.

Everyone in the dental profession knows Dr. L. P. Haskell, but everyone does not know that he has written a book. Dr. Haskell has devoted sixty-five years of his life to one department of prosthetic dentistry—artificial dentures. He has written the essence of his experience in this volume, and it is now for sale by a committee selected by Dr. Haskell to represent him. He does this because he has more taste for the art of dentistry than he has for business. In fact he has so little taste for business that he has lived to the age of eighty-five years without thinking much about it. No man ought to be compelled to work after he is eighty-five, and so Dr. Haskell's friends have decided that this book should be made to support him comfortably for the rest of his days. It is a small volume of sixty-three pages, and the price is \$2.00. There is a splendid portrait of Dr. Haskell in the frontispiece, and this itself is worth the price of the book to the many friends in the profession who know and love him.

Committee—Dr. C. N. Johnson, (chairman), 31 Washington St., Chicago, Ill.; Dr. T. W. Brophy,, Dr. J. A. Bullard.

A Big Question

One of the big problems confronting the dentist is the permanency and satisfaction-giving character of his work—particularly in root canal fillings and putrescent pulps.

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From one to three treatments, ONLY, are necessary with "DENTONE"—it will never disappoint you—with most other preparations four or five, or even more, are usually required.

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Dominion Dental Journal

VOL. XXIII

TORONTO, JUNE 15, 1911.

No. 6

Original Communications

PYORRHEA ALVEOLARIS.

STEREOPTICON LECTURE, BY ELGIN MAWHINNEY, D.D.S., CHICAGO.

Delivered before the Winnipeg Odontographic Society, Monday Evening, February 27, 1911.

Mr. President and Gentlemen, Members of the Winnipeg Odontographic Society:

I can assure you it gives me the greatest pleasure indeed to appear before you to-night to address you on this important subject, which has to do with our every-day practice. I have been making a specialty of the treatment of diseases of the soft tissues of the mouth for fifteen years, and from the experience gained during these years I have come to regard the treatment of pyorrhea alveolaris, with its kindred diseases, as constituting certainly a very important, if not the most important, department of dental practice; for I realize, with you, that during adult life there are more teeth lost from these diseases than from all other causes combined. There was a time, not so many years ago, when teeth affected by this class of disturbances were regarded as hopeless, even among the rank and file of the dental profession, and I am sorry to say that through the influence of that apparent conviction on the part of the profession, the public have come to believe that little or nothing can be done to stay its ravages, or to prevent its inception. It is very common for all of you to hear people say: "There was nothing the matter with my tooth except it just got loose and fell out, and there wasn't anything the dentist could do for me." I am glad to say that through the efforts of scientific men this class of disturbances has been studied, and to a certain extent many of the etiological factors determined. We find that the more intelligently we approach these diseases the more we realize that they are amenable to treatment.

It is not my purpose to-night to go into a scientific dissertation upon the cause or causes which lead up to the manifestation in the oral cavity of what we call pyorrhea alveolaris, but I do wish, in passing, to refer to certain contributing causes which must be recognized if we are going to bring practical benefit to those suffering from this malady.

We understand that the manifestation of this disease in the mouth is one of destruction of tissue; and that the tissue affected is

vitally associated with the retention of the tooth in its socket. Before we can intelligently discuss the treatment it is well for me, I am sure, to review with you a few slides which will serve to recall the relation of the tooth to its surrounding tissues.

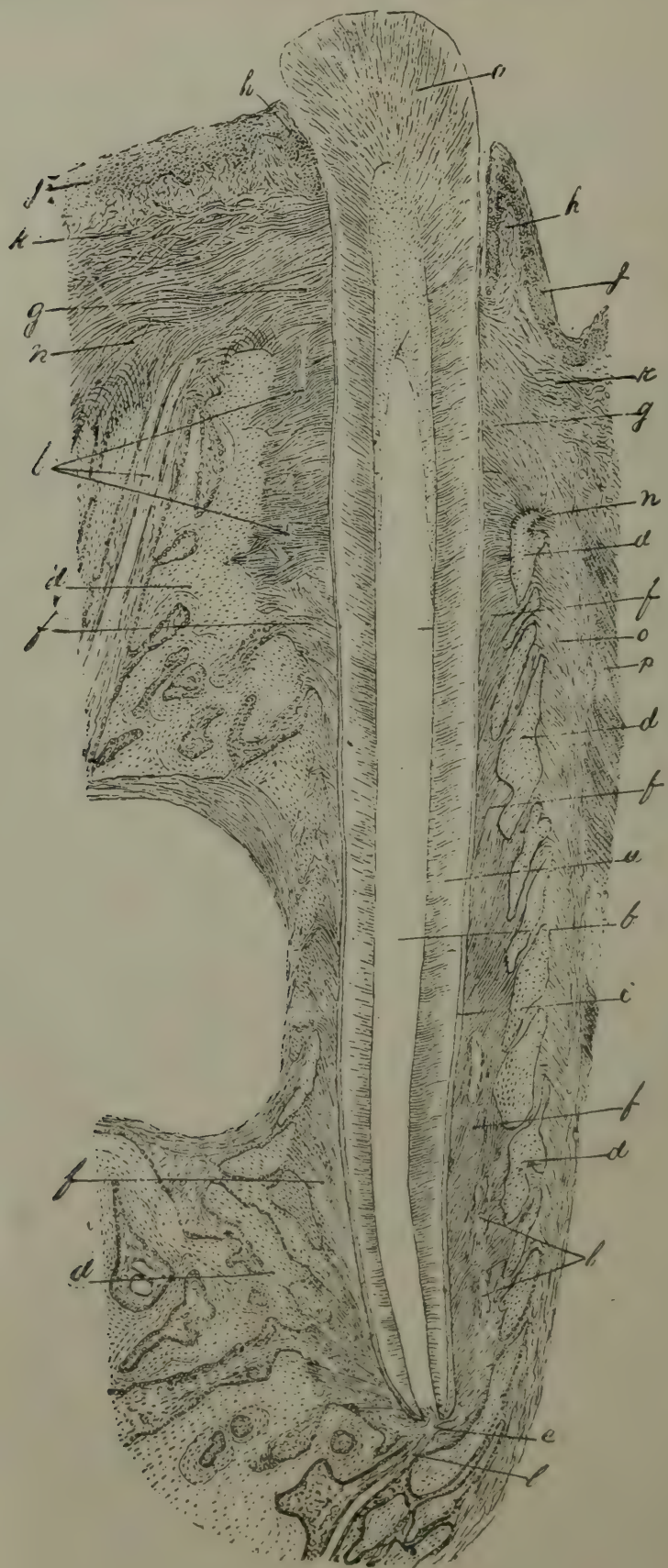


Fig. 1

Fig. 1.—Longitudinal section of small incisor tooth of kitten with its membrane and alveolus. The portion included in the illustration is one-fourth in long. *a, a*, Crown of tooth and dentine. *b*, Pulp chamber and root canal. *c*, Enamel. *d, d, d, d*, Alveolar walls. *e*, Apical space and apical foramen. *f, f, f, f*, Body of periodontal membrane, showing particularly the arrangement of its principal fibres, their direction, etc. *g, g*, The cervical portion of the periodontal membrane, showing the relation of its fibres to the gingiva *h*, the tangled mass of fibres forming the gums *k*, and the periosteum *n, n*, of the outer surface of alveolar wall. *h, h*, Gingiva. *j, j*, Epithelium. *k, k*, Coarse fibrous tissue of the gums. *l, l, l*, Bloodvessels traversing the periodontal membrane. A section showing the smallest number of these was selected, for the reason that the fibrous arrangement is less distorted. *m*, Sacculus of permanent tooth. The fibres of the periodontal membrane become continuous with those of the periosteum at *n, n*. *o*, Periosteum. *p*, Attachment of labial muscles. The intention of the illustration is to give a full view of the arrangement of the fibres of the periodontal membrane, and the relations of the tooth, membrane, and alveolar wall.—BLACK.

Fig. 1. Longitudinal section through the centre of tooth and surrounding parts. The picture is taken from Dr. G. V. Black's *Periosteum and Periodontal Membrane*.

I wish to particularly call attention to fibrous connection of the periodontal membrane and the gum tissue as illustrated at h-k-g. These fibers anastomose with the periosteum covering the alveolar process, and also with similar fibers of adjoining teeth, so that the teeth are really laced together, and the gum is laced down to the neck of the tooth. Therefore, at this point I can call your attention to a very important thing to be kept in mind in all operations about the teeth: namely, the importance of preserving intact these few fibres. When the few fibres which attach the gum and the tooth neck and the alveolar border are destroyed, either by the irritation of the deposit of tartar or by the development and progress of ulceration, or by the use of separators, files, lances, scalers, and other instruments in such a way as to tear or cut or destroy those fibers, when those fibers once lose their connection the normal protection of the periodontal membrane is effectively destroyed and gone; that tooth will eventually give serious trouble: if not pyorrhea, then the falling away of the gum from the tooth neck, the sensitiveness of the neck below the enamel margin, and all the train of conditions that follow such a condition.



Fig. 2

Fig. 2 shows a ground specimen, and will give you some idea of the gum tissue as well. This is a longitudinal section, "G" being the gum margin, the lingual of the gum. It shows the denseness of the epithelial covering of the gums. These cells serve as a protection to that gum, and the gum serves in turn as a protection to the tooth, acting as a shield to food and light, and also hugging the tooth neck, keeping the tooth itself thoroughly clean; at "F" you see the fibrous attachment as we go down the tooth; the beginning of the bone and alveolar process and attachment across. See how these fibers come clear across over the alveolar process, so that the tooth is virtually swung in its socket exactly as you swing a hammock, and if you destroy the fibrous attachment on any one surface of that tooth you will immediately have, as a result, the tooth being drawn away from the surface where those fibers are destroyed.



Fig. 3.—Longitudinal section of peridental membrane; *ep*, epithelium of the gum; *ep2*, epithelium lining gingival space; *du*, duct like structure; *cm*, cementum; *b*, blood vessel; *f*, fibres; *ec*, epithelial cords or glands. (Noyes)

Fig. 4.—Longitudinal section of membrane on the proximal side of root; *d*, Dentin; *n*, Nasmyth's membrane; *cu*, cementum; *ep*, epithelium of the gum margin; *ep2*, epithelium lining the gingival space; *gg*, so-called gland of Sirres; *du*, duct-like structure; *ec*, epithelial cords or glands. (Noyes)

Fig. 3 is taken a little lower down.

Fig. 4. At "G G" brings out the so-called gland of Sirres. You know the statement has been made that there are no lymphatic glands in the peridental membrane, and while perhaps we have not positively proven their existence, the fact remains that the peri-

dental membrane has an excretory function. It does excrete. I want you to remember that point, because it will have something to do with explaining phases of pyorrhea alveolaris. You can prove the excretory function of the periodontal membrane and the gland surrounding the neck of a tooth by a very simple method. Saturate yourself with iodide of potash, and you can get an iodine test around the gums inside of five hours after you take the iodide of potash. The iodine is being eliminated by way of the excretory organs, including the periodontal membrane, so this gland of Sirres, which is situated just under the margin of the gum, appears to have the function of an excretory organ.

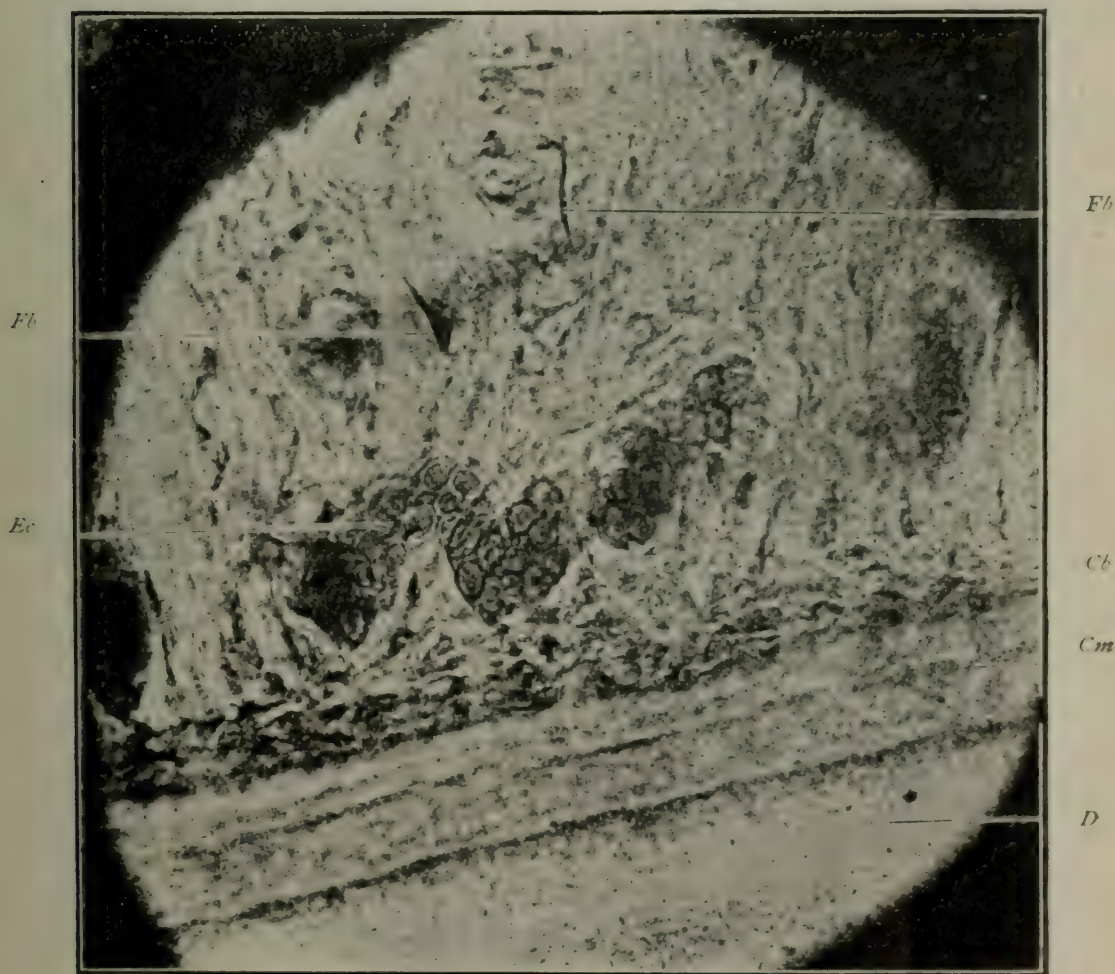


Fig. 5.—Epithelial structures (from sheep): *Fb*, fibroblasts; *Ec*, epithelial structures; *Cb*, cementoblasts; *Cm*, cementum; *D*, dentin (About 700 \times .) (Noyes)

Fig. 5. At "E C" shows the cutting across of these glands in this periodontal membrane. Fig. 6 is another of Dr. Frederick Noyes', and I think it is wonderful, in how he succeeded in getting specimens to show what we believe to be glands. They certainly have all the epithelial arrangement of glands, and I think we have a right to say they are glands, although we have not proven them.

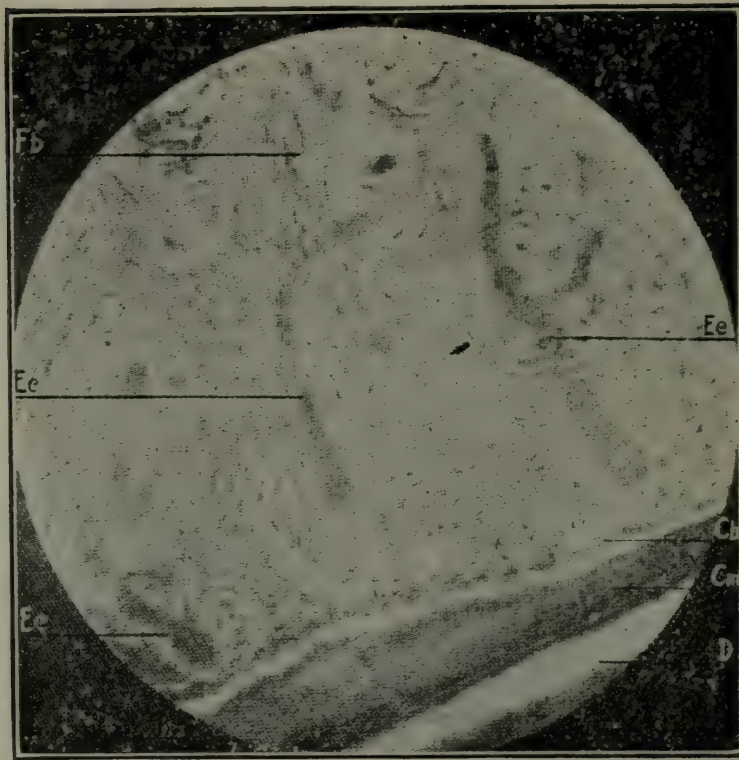


Fig. 6.—Peridental membrane next to the cementum highly magnified.
fb, Fibroblasts; *ee*, epithelial cords or glands; *cb*, cemento-
 blasts; *cm*, cementum; *d*, dentin.

(Noyes)

Fig. 7 is one of Dr. Black's diagrams, and shows the construction of all the tissues at the gingival border at the tooth neck.

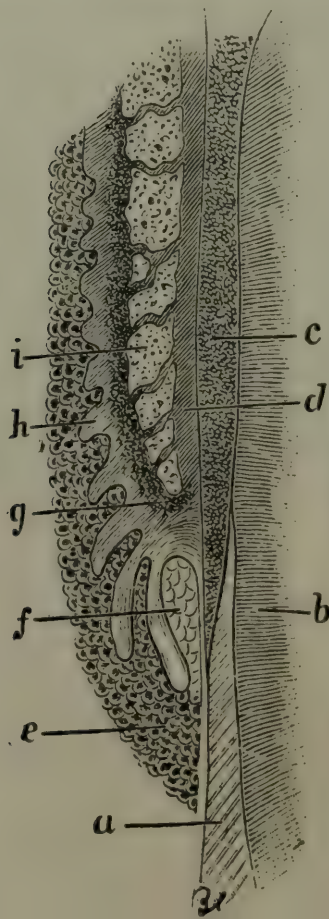


Fig. 7 (Black)—The Gingival Border: *a*, enamel of the tooth; *b*, dentine; *c*, cementum; *d*, peridental membrane; *e*, epithelial covering of the gingival border; *f*, gingival organ; *g*, dental ligament; *h*, subepithelial tissue; *i*, bony wall of the alveolus.

The next, Fig. 8, is a cross section C cut across the tooth just above the alveolar process, so as to catch the fibers just before you get to the bone. You see how they run—in every direction. This is a good point for the orthodontia man to keep in mind. This shows how hard it is to rotate a tooth in its socket. These fibers are intended to protect the tooth from stress in every direction. The fibers are attached to the gum and the periosteum over the border of the alveoli, of which this section is made.

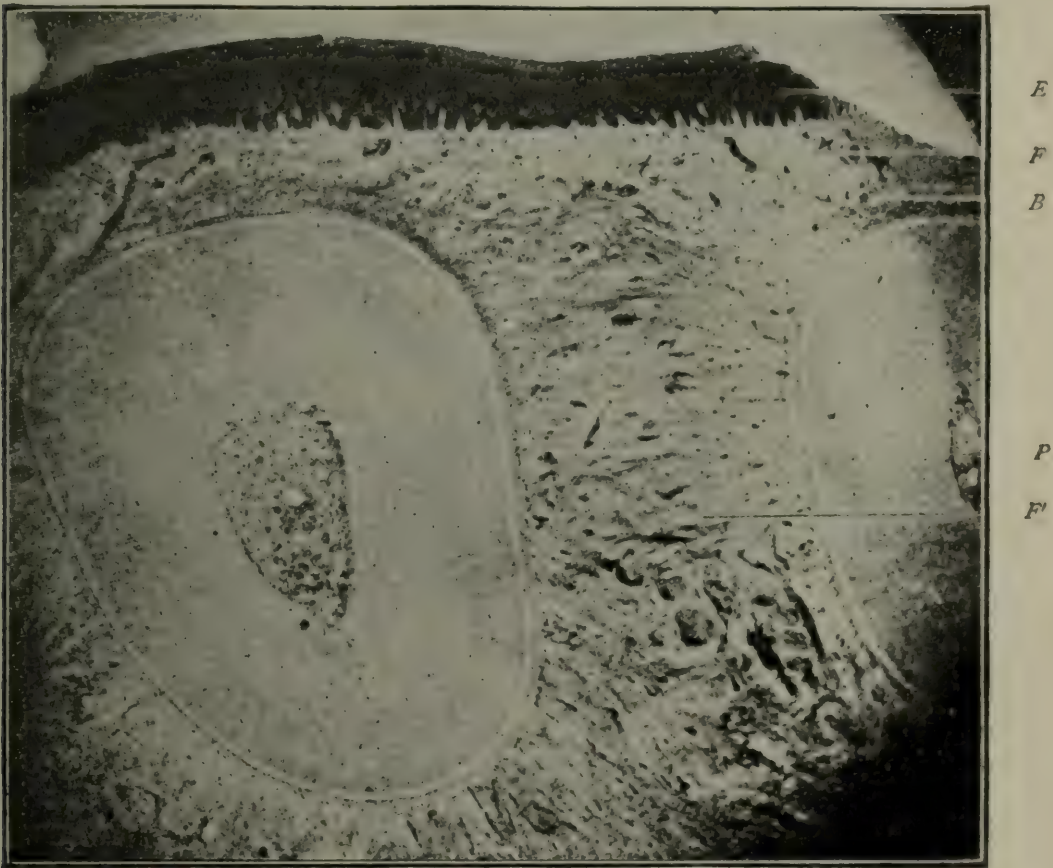


Fig. 8.—Transverse section of the periodontal membrane in the gingival portion (from sheep): *E*, epithelium; *F*, fibrous tissue of gum; *B*, point where periodontal membrane fibres are lost in fibrous mat of the gum; *P*, pulp; *F'*, fibres extending from tooth to tooth. (About 30 \times). Noyes

Fig. 9, a diagram of Dr. Black's, which shows it more clearly and brings the fibers out very well. This drawing was made from the slide which was on the screen just now.

Figs. 8 and 9 show the fibers' course from one tooth to another at the border of the alveolus. This is where we are interested in the periodontal membrane, so far as pyorrhea alveolaris is concerned. The gum tissue, free margin of the gum and the attachment of the gum to the tooth neck, and attachment of the gum to the periosteum. The gum is pinned down to the periosteum and neck of the tooth and the bone by the strong lacing of the periodontal membrane.

So much, then, by way of review of the relations of the normal tooth structures with reference to the tooth attachment to its socket.

Of the diseases affecting these tissues the most simple form is what

we term simple gingivitis, by which we mean an inflammation of the free margin of the gum. In its simplest form it appears in



Fig. 9.—Cross section of central and lateral incisors below the rim of the alveolus through the neck of the teeth: *A*, central; *B*, lateral; *C*, pulp chamber of lateral; *D*, *E*, cementum; *G*, *H*, fibres of periodontal membrane; *J*, *K*, *J*, *J*, epithelium (Black.)

young folks, sixteen or eighteen years of age, and is usually the result of some slight systemic disturbance, which has to do with the clogging of elimination. The sufferer has perhaps partaken too freely of sweets, eaten too much meat, or something of that kind, which is not being eliminated, and because not eliminated by the natural channels is being eliminated partly by the mucous and periodontal glands, and, as such, acts as poison to those tissues, resulting in inflammation.

In its simplest form, affecting young folks, if the teeth are cleaned and polished and a very mild antiseptic astringent mouth-wash prescribed, it gets well by itself, without much trouble. But when this gingivitis passes on into more severe and complicated varieties of gingivitis whereby the whole margins of the gums become gorged with blood and everted—that is, turned away from the tooth neck—and through this hypertrophy and this swelling we have an amount of discomfort which brings the patient to the dentist. (See Fig. 10.) Such gums usually bleed upon the slight-

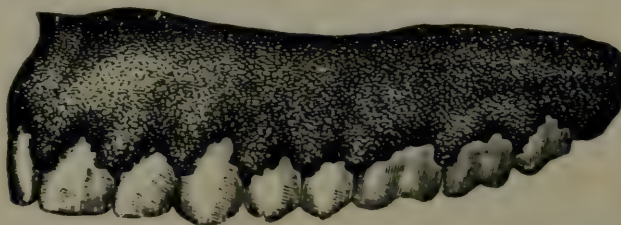


Fig. 10.—Showing hypertrophy of gum gingivus. (Burchard.)

est touch, and the patient usually comes complaining, and the first complaint is that the gums bleed dreadfully when they clean their teeth. If this is not corrected it usually passes into an ulcerative gingivitis, wherein this tissue, which has lost its power of resistance, either succumbs to a micro-organic invasion, which results in an ulceration of the gum margin, represented fairly well by Fig. 11, although this picture is taken a little later when the case has gone on in process of ulceration until the tissues are falling away from the normal, festooning around the enamel line of the tooth.

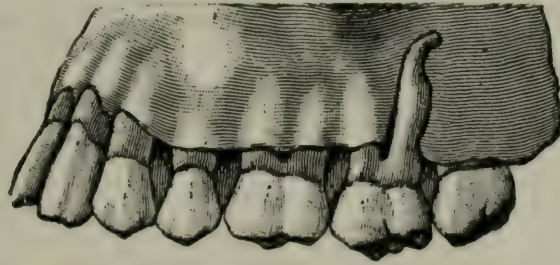


Fig. 11.—Showing absorption of gum gingivus and alveolus. (Burchard)

The next picture, Fig. 12, represents the next simple form of these troubles, that which is known as calcic inflammation, which, as you know, is of two varieties—one due to the irritation of salivary calculus, which is represented by the picture, Fig. 12, which is a copy taken from the illustration in the American System of Dentistry, by Dr. C. G. Black, and is typical of a case of which I have seen any number. This is a case where there is a deposit of calculus from the saliva, little by little, first just above the free



Fig. 12.- Heavy Deposits of Salivary Calculus causing general Calcic Inflammation. (Black.)

margin of the gum, and that becomes infiltrated with poisons and the gum drops away through that irritation; a little more deposit, and the gum drops away until the teeth are lost absolutely from salivary calculus; you have seen them. I have some specimens of teeth absolutely covered, crown and root, until there is not a particle of natural tooth showing to view; covered with salivary calculus.

Fig. 13. Salivary calculus on roots of the molars; bicuspid gone. A very common thing. The gum just sloughs away, a little ahead of the deposit, and then the deposit forms on the ground gained, and so on and so on, until the whole tooth is lost through a process

of inflammation resulting from the direct irritation of the salivary calculus.

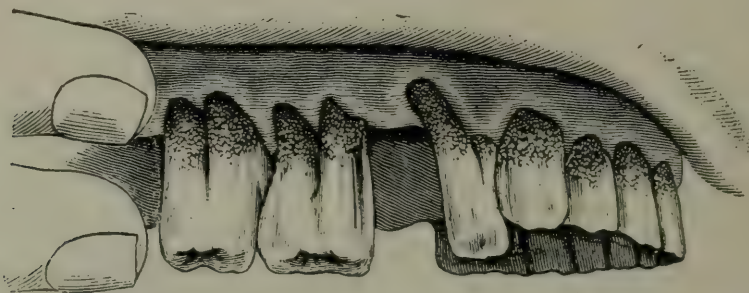


Fig. 13. - The Alveoli irreparably destroyed by Calcic Inflammation. (Black.)

Fig. 14 shows another kind of trouble, where not only do we have the salivary calculus depositing above the free margin of the gum, but we have a deposit which we call serumal calculus, because we believe it is deposited from the serum of the blood. I am not going to dwell on that point at length, but I might say in passing that the source of serumal calculus is being disputed at the present time. When this serumal deposit takes place through the irritation there we have inflammation and a sloughing away of the peridental membrane, and a pocket under the gum where the membrane has been destroyed; a pocket forms, which rapidly fills with pus, and thus a true pyorrhea, because the term "pyorrhea alveolaris" refers to pus flowing from the alveoli.

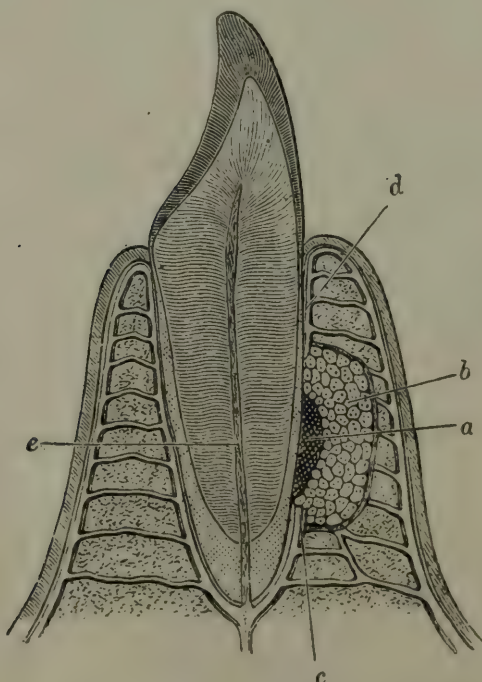


Fig. 14. - Hematogenic calcic pericementitis (Burchard.)

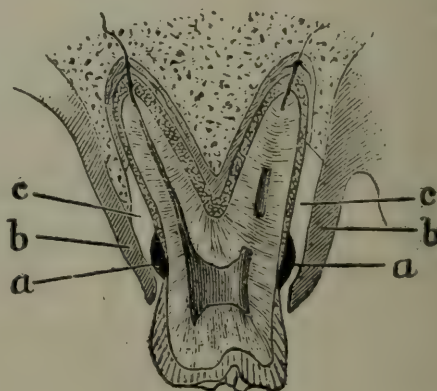


Fig. 15. - Section of an Upper Molar showing Destruction of its Membrane and Alveolar Wall by Phagedenic Pericementitis: *a*, deposit of serumal calculus; *b, b*, gum covering pus-cavity; *c, c*, formed by the destruction of the peridental membrane and alveolar wall.

Fig. 15 is a molar showing the very same as the other, the deposit on both sides of the tooth and the pocket developing here under the gum and the pocket away up on the root, still covered

with gum tissue. In many cases I have found that kind, where there is a pocket under the alveolar process, and little by little that goes on until the alveolar process is destroyed and one or more surfaces of the tooth affected and the tooth is lost.

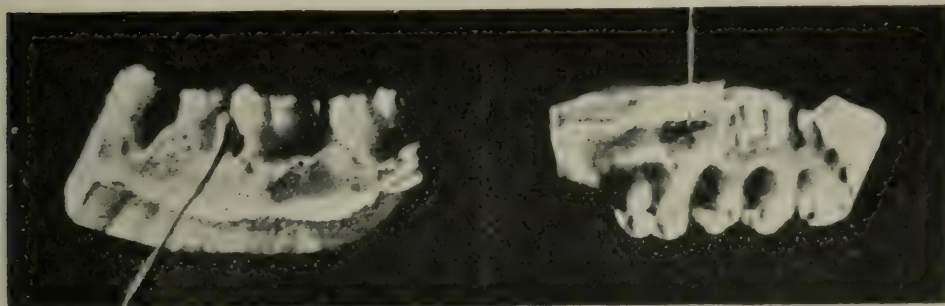


Fig. 16.

Fig. 17.

The next slide, Fig. 16, was put in particularly to call your attention to the beginning of another type of pyorrhea, namely, that pyorrhea which is not the result of deposits of tartar at all, but which is the result of some physical inharmony between the teeth. This case is of a patient who came to me because of this swelling of gum tissue at "A." It was so tender the first day she came that I couldn't take an impression of it, but I let the blood out of it and cleaned approximating teeth as well as I could, and gave it a treatment, and when she came the next time I took this imprint, which is at a disadvantage because the gum had reduced very greatly in size. Now, just a word as to what would go on unless this was interfered with. What was the trouble in the first place? The trouble was this: in between the molar and the bicuspid tooth caries set in, which was repaired with gold fillings. Gold fillings with flat surfaces of contact, which allowed the teeth to drop together, the occlusion being such that the teeth did drop together, crowding the gum out of its natural place. These teeth are very tight together. A piece of silk could not be drawn through to the gingivus. The gingival margins of the fillings were in close position, and instead of being an eighth of an inch apart, as they should be normally. The gum was literally crowded out by the improper filling of these teeth. If it is not interrupted the next thing that happens is infection and the development of a gingival abscess. The pus forming within the gingival margin of the gum, tissue swells up and fills up with pus. You have seen many such cases. You puncture it and get a great flow of pus. If that is not interrupted by the dentist following this formation of pus comes the sloughing away of the gums. I have lanced this and let the pus out of it, and notice how the inflammation has already destroyed the gum at the angle of the tooth (see Fig. 16). One of the gentlemen that we examined to-day had exactly that thing. It started in between the teeth and gradually crept around until it was on

either side. The next one, Fig. 17, at "A," will give you a pretty good idea. That is what would develop in that case—an abscess inside of the gum—an abscess occurring in the gum tissue at that point "A."

When the case gets well the suppuration stops and what you have left is this nasty condition (see Fig. 18), tooth exposed root-wise. This is a cast of one of my cases.

Let us examine Figs. 17 and 18 carefully. What are we to do with that case? A gentleman asked me to-day: "What are you going to do with a case of that kind?" What happened in these cases? There was no caries here, not a particle. But there was caries between the first and second bicuspid. The caries of the contact point. Those teeth were separated and the contact point filled, the old-fashioned method, filling it without cutting it out to the occlusal. The normal contact was never restored, the teeth closed together, and it is more or less through the forced occlusion the first molar came forward, opening a space for the fibers of food to catch, and gradually the tooth is spread apart and everything

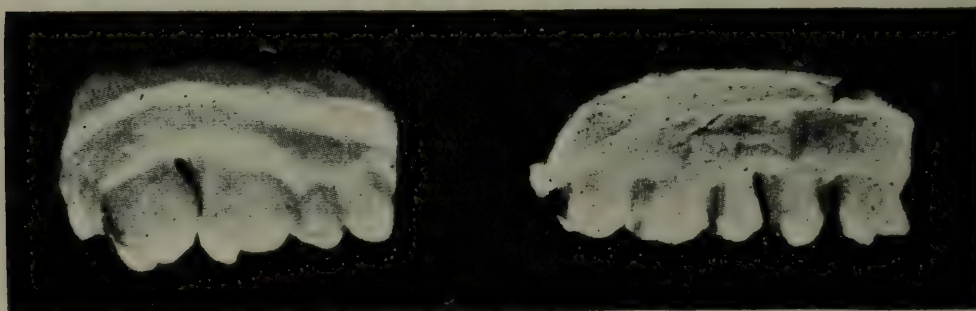


Fig. 18

Fig. 19.

pushed and crowded into that space, and just sets up the same condition as before—the swollen, bleeding and ulcerated gum, and finally a gingival abscess, and when that has discharged pus and stopped sloughing we have this loss of tissue. It is very evident there is only one way to cure it. In Fig. 18 the way to cure that trouble, if not too late, is to take out this imperfect filling, wedge the teeth apart to their normal position, and give a space for that interproximal tissue to form. In this case the alveolar process has all gone: no gum and no alveolar process; a probe will go to the apices of the roots of those teeth on those surfaces. It is very clear that the spreading apart and restoring the space between the bicuspids will not cure this trouble, because there is so much periodontal destruction on those proximating surfaces of molars that those teeth will be pulled further and further apart all the time by the force of the attachment of the healthy periodontal membrane on the other surfaces. What are you going to do? There is only one thing to do, which I did in this case, and that was to get into the mesial surface occlusally of the second molar, and distally occlusal of the first molar, and put in a double inlay across. Wedge this other

apart, pushing this up first and then cleaning and polishing that, and it will get well by itself, and the gum will be largely restored, and has been in this particular case. In this case the gum tissue has been so restored that you wouldn't recognize it as the same case, by merely excluding food from that interproximal space.

Now look at the next one, Fig. 19. That was one of the most interesting cases I have ever had. The picture does not show it as it should. This was a case which was sent to me by another dentist for the treatment of the pyorrhea which affected the whole mouth, of which this is a type. This represents the upper right cuspid and bicuspid and molar region—the buccal. When the patient presented the first bicuspid was so loose it could have been removed practically by thumb and finger. The cuspid tooth is pushed out of line to the labial fully the thickness of the tooth, like a tusk up under the lip. The case is a man about forty years of age. What happened here? Well, see; here is what happened. There was caries in between the molar and bicuspid, which was restored by two amalgam fillings without any regard whatsoever to the contact point. The result was the occlusion was such that these two teeth dropped together. The second bicuspid dropped back, opening a space between the second and first bicuspids. For a period of five years food jammed in there until it destroyed all this and crowded all this forward, pushing the cuspid tooth entirely out of line, as stated. Now, one of the most remarkable things occurred in the treatment of this case of any I have had. These teeth were all vital. In the process of treatment the first—and this illustrates the difficulty which the specialist has often—there were five places in the mouth, of which this is the worst, due to the same cause. I sent the patient back to her dentist, with a note on which I had marked the faulty contacts, and asked him to please remove the faulty fillings, wedge the teeth apart, and restore contact, and he sent the patient back and said that was a hobby of mine, that those fillings were saving the teeth all right; it was foolish to take out good fillings when clearly the case was pyorrhea, and if you can cure this pyorrhea by removing and replacing those fillings with better ones I should like to have you do it." There wasn't a thing for me to do with a fellow like that, but to take the case myself, and I went, inch by inch, all over that mouth and I wedged those teeth apart. Of course the first thing I did was to clean out those pockets, because I could get at them, carefully clean and polish the roots just as you saw me do this afternoon, and then wedge the teeth apart and restore the contacts all around; and in this case, after wedging that tooth apart I ligated the bicuspids together, after the fillings between molar and bicuspid were completed, to bring back normal contact between bicuspids, and I fastened it with a double inlay across. Now I did that in all the mouth, and I tell you, gentlemen, the truth when I say all I did to the treatment of that pyorrhea at all was the cleaning and polishing of those pockets

once. The restoration of the normal harmony of the tooth cured the pyorrhea. The cuspid tooth that was out of line went into place itself, without any treatment whatever. After I pulled the bicuspids back where it belonged the cuspid went back into place by itself.

Fig. 20 is a case you so often see. This is a case where the teeth decayed at the contact points between the two central incisors. The left central overlapped the right slightly, and they decayed at the point of overlapping. The teeth were separated by a separator and gold fillings placed in that position. The teeth never went back into normal position; they always stayed apart, and kept getting a little more so and a little more so, and the left one moved to the labial. Two years after the placing of the gold fillings the patient came to me for the treatment of pyorrhea. I elicited from her the history just given. I asked her if in the use of the separator it was very painful, and she said it was exceedingly painful and that

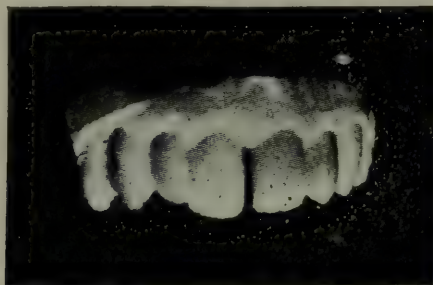


Fig. 20.

following the use of the separator for two or three weeks her gum was swollen almost down to the cutting edge of the teeth, that the tooth never went back after the separation was removed—proving that the separator was poorly adjusted; that it slipped up and actually tore the periodontal attachment to the gum, which has never healed, resulted in the condition that you see this to be a picture of. When she came to me there was a well-developed pocket on the left central to the lingual. I could pass a probe almost up to the end of that tooth at the mesio-lingual angle of the tooth. Press my finger on it and there would flow a teaspoonful of pus. What was to be done in that case? I curetted the pocket and drew the teeth together by silk ligatures where they belonged, and held them there permanently. Why permanently? Because the attachment of the gum to the tooth and to the alveolar process was destroyed and I could not hope to restore it; hence, the teeth would never remain in that position without a support, so what I did was to add just a staple on the lingual. I drilled into these teeth in that position and took a piece of platinum-iridium wire and put a staple high enough up so the occlusion would not interfere with it, and it will remain forever. I have thousands of those staples in use to-day. There is a picture of the case, completed.

Fig. 21 represents a case of serum deposits; under the free margin of the gum the destruction of the tissue, formation of a pus pocket, and pyorrhea alveolaris.



Fig. 22

Fig. 21.—Section of an Upper Incisor showing destruction of the Periodontal Membrane and Eversion of the Alveolar Wall with thickening of its Border: *a*, serumal calculus; *b*, thickened border of the alveolar wall; *c*, pus-cavity.

Fig. 22.—Through the accumulation of tartar, or whatever produces the gingivitis or inflammation of the gum margin there, produced a destruction of the gum septum and the border of the alveolus between the teeth and the falling away of that tissue, as you see it there. There is no gum there at all. We had a case just like Fig. 22 to-day. The President of your Society brought it here. He has exactly that space there between the lateral and the central. There is no gum in there; nothing at all. The inflammation has gone on there and the tooth dropped back and pus accumulates, and it is a source of trouble, and results in an atrophy, drying up,



Fig. 23

Fig. 24

Fig. 25

Fig. 26

Fig. 23. Serumal calculus covering root of an upper cuspid, gum tissue was in normal position.

Fig. 25. Serumal calculus covering the root of lower bicuspid.

Fig. 26. Serumal calculus covering the apical third of root of bicuspid.

shrinking away, of the gum and alveolar process or surfaces about the tooth.

Figs. 23, 24 and 25 show some of my cases I didn't heal. I extracted them, and see the tartar that is on them. The gum in these cases was normal in position; that is why I kept the teeth. But there was no alveolar process and no attachment, and I removed these teeth with thumb and finger.

Fig. 26 is a bicuspid root and lower second bicuspid root. It had an alveolar abscess discharging at the gingivus, which often is mistaken for pyorrhea, and it was treated by half a dozen men in the usual method. Finally it got into the hands of a gentleman who always cures alveolar abscesses without a single failure by squirting carbolic acid through the tooth and out through the sinus, which he did in this case. He filled the root in this case perfectly. In about a week it broke out again and he said, "I don't know what is the matter; you had better go and see Mawhinney." I explored it and told her what was wrong and she said: "I had better have it out," and I wanted the tooth, so I took it out.

You see the serum deposit all over the apex of the root of that tooth. In passing I may tell you of an interesting thing which I did. I had two extracting specialists in Chicago save for me all of the teeth that they extracted from patients sent to them by dentists because alveolar abscesses couldn't be cured. I asked them to save me all those teeth. I received more than a pint of them. Teeth which had been extracted because dentists couldn't heal chronic alveolar abscesses, and I found in eighty per cent. of all those teeth extracted tartar was the cause of the abscess. You could treat them "till kingdom come" unless you get the deposit off. How are you going to get the deposit off? The easiest way is to resect the end of the root and take it out. From five or six years' experience in attempting different methods of getting that deposit off, I have concluded the most satisfactory, easiest, safest and best method is to cut the root off altogether. By the way, that doesn't belong to this lecture, but got in by accident.

Fig. 27, showing tartar all over the roots. The bifurcation between the lingual and buccal roots of a molar is covered with tartar. Now why did I take that tooth out? That is the second molar. The first molar was in position, the third molar was in position, and the gum was in position: how could I get the tartar out of there? I couldn't get into it. I knew where the trouble was, but to save me I couldn't get it out. To-day I would devitalize the pulp of that tooth and cut the lingual root off and take that root out; I have many such cases. I put the slide on to show you how inaccessible these deposits sometimes are, how difficult it is by instrumentation to get at the deposit and remove it.

Look what has happened to this case. Do you see that? Here is the line of cementum. You see that tooth neck is absorbed at that point—decidedly roughened. I put that slide in for the specific

purpose of calling your attention to the fact that in the treatment

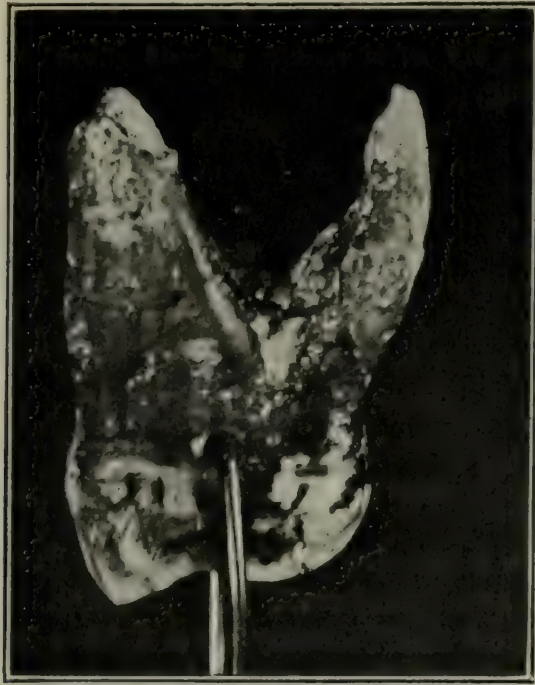


Fig. 27

of this trouble not only do we have deposits to contend with, but we have the positive absorption and roughening of the roots of the tooth to contend with.

Fig. 28 represents some more—pyorrhea pockets clear up under the gum.

This is a diagram of Dr. Black's, which illustrates the case which I showed a few minutes ago. Contact point lost, and things jamming in here, alveolar process and everything gone clear down to the apical third.

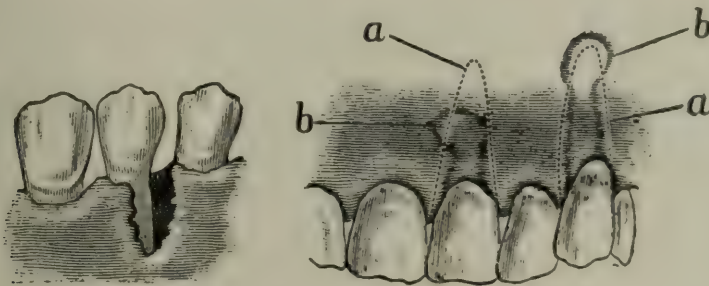


Fig. 28

Fig. 29

Fig. 29.—Illustration of a Case of Phagedenic Pericementitis: *a, a*, dotted lines representing the outlines of the roots of the teeth; *b, b*, irregular lines representing the extent of the destruction of the periodontal membrane and walls of the alveolus. It will be noted that the gums appear nearly perfect (Black)

Fig. 29 shows the destruction of the alveolar process clear up to the apex of the tooth, and yet the gum is in nearly normal position. That is very common on the labial of cuspids. Flowing of pus here, free flowing of pus; you could pass an instrument almost up to the end of the root.

Fig. 30 is the same as Fig. 29, but taken at a later stage, with the gum gone. In Fig. 29 you can pass your instrument up to where that deposit is, high up on the root. How are you going to clean it? I invariably open them on the labial and clean them through that opening.

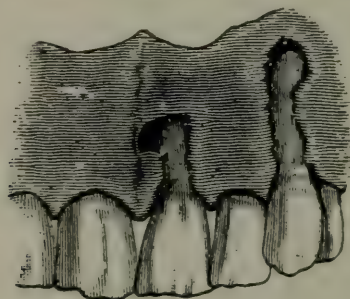


Fig. 30



Fig. 31

Fig. 31.—Incision for the Treatment of the Root and Alveolar Process in a case of Phagedenic Pericementitis. (Black)

Fig. 31.—There is nothing but gum here. First make a little incision like that, and underneath you will find the root covered with deposit up under there; many cases I have had of that kind where men have failed to get a result because they have failed to get the deposit off; and failed to get the deposit off because they couldn't reach it between the gum and the tooth neck, and by just making an incision like that and following it into the pocket and getting it wide open where you can look at it it can be cleaned and polished. It will heal up very rapidly. I never had a case where I had to stitch the incision; they usually glue hp over night.

Fig. 32 is a pyorrhea case or phagedenic case which has advanced, producing abscess by the destruction of the pulp by the progress of the disease right along up beside the tooth. The lingual of a molar. How many cases have you had of that kind? You can

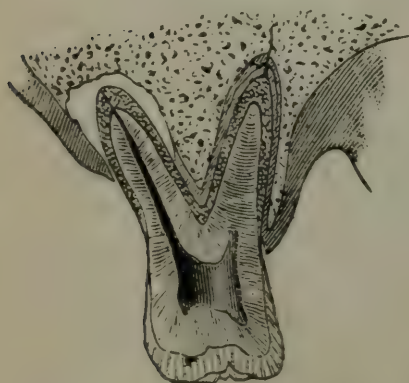


Fig. 32



Fig. 33

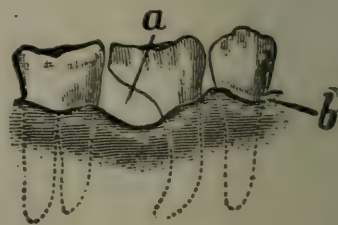


Fig. 34

Fig. 32.—Chronic case of Phagedenic Pericementitis in which the whole of the Palatine Root of an upper molar is denuded of its membrane.

Fig. 33.—Showing upper molar with lingual root removed. (Black)

Fig. 34.—Showing lower molar with distal root removed. (Black.)

press a drop of pus day after day and you wonder what is the matter. Does the tooth have alveolar abscess, and you get a response showing it is a vital pulp and the pulp is in all probability

alive in bucal channel, but it is gone in this lingual one. What are you going to do in that case? Destroy the pulp remaining and fill the canal and cut the lingual root off, Fig. 33. I would rather have the tooth supported by the two buccal roots, sound and well, and run my chances of its remaining permanently so, than trying to doctor up a case in the condition that one is. I don't cut off roots any more with lower molars, as in Fig. 34. We had a gentleman to-day with the distal root of the molar gone. It had been cut off, and was loose—the whole tooth was loose. Instead of cutting under, like Fig. 34, taking the root out, leaving a weak distal half, it is easier to take a knife-edged stone and divide the tooth through the bifurcation, crowning the remaining good root and attaching a dummy.

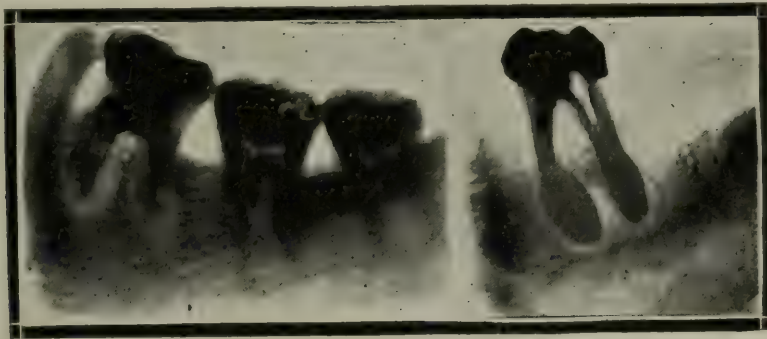


Fig 35

Fig 36

I put this slide in, Fig. 35, because it is a case which came to me carrying gold inlays and with pus exuding all around the gum margin. I went in everywhere and curretted and treated, and the case presented a history of having had the pulp removed and the roots filled, but I couldn't get anywhere with it, and had an X-ray made; this brought out the fact that the pulps were removed and roots not well filled. What I had here was actually an alveolar abscess discharging at the gum margin.

Here was a case that puzzled me more than a little, Fig. 36. Pus discharging here, and I worked like a trooper on this surface here. I cleaned that, and the X-ray shows I had it clean; and I tried to test that tooth very carefully, and it proved to be vital as far as I could see. Heat, gutta percha and cold and all that gave the response, and I thought there was some excrementosis of root, and I had an X-ray. You see the alveolar abscess as well. When there is an alveolar abscess there are often complications and we are often deceived. Sometimes we take the discharge of pus from an abscess because of the manner of its discharge, to be a pyorrhea pocket; and sometimes we take the discharge from a pyorrhea pocket, because of its discharge through a sinus, to mean an alveolar abscess; and I have drilled into lots of teeth that I was sure had a sinus from an alveolar abscess and found them vital teeth, and instead of an abscess I had a pyorrhea pocket.

I have a lot of slides made from X-ray pictures, but I didn't bring them along because I thought this was enough to show that alveolar abscess does act as a complication in pyorrhea alveolaris.

Now we may have the lights on. So much for the causes and manifestations of various forms of pyorrhea alveolaris, but what you are mostly interested in is—what are you going to do with it? What is to be the treatment of pyorrhea alveolaris?

First, diagnosis. Find out what the trouble is. I want to emphasize the importance of the X-ray where you are in doubt. It saves a lot of trouble. It clears up a lot of things. By diagnosis I mean not only determining what the trouble is, and what the cause is, but determining the actual point of irritation; or, in other words, locating at what particular spot of a given tooth the irritation is. Oftentimes we have pus discharging on one surface when the irritation is on another. I had a case not long ago which will illustrate this point. A lady sent to me by another dentist had a discharge of pus on the labial of two lower incisors. He was a very thorough man and had treated this trouble for almost six months, but the pus continued. He took the pulps out of the teeth and filled the roots and didn't get rid of this pus. The gum was in normal position. I tried to locate the irritation through the exit of the pus, but I couldn't find it, and I took the lance and cut into where appeared the pocket on the labial two-thirds to the apical point, and the lance exposed the deposit, which I removed, and it got well. No treatment other than the one curetting and one polishing of these cases is usually necessary. The difficulty was he couldn't find his deposit through the exit channel because he couldn't reach it. By making a direct means of exploring I found it.

Therefore, the first thing is correct diagnosis. Know what your trouble is and where it is.

The second necessary point to a cure of this trouble is—and I put it the second thing—the co-operation of your patient. Experience has taught me that you might just as well try to bring down the moon sawing on an old fiddle as to heal and cure pyorrhea if the patient don't want it done badly enough to do his part. Please don't construe this to mean that lots of patients wouldn't want it if they understood what it meant to them who, at first thought, have no interest in it. Lots of patients who condemn their teeth to the forceps do so because they don't know any better, and because they don't realize what can be done for them; but, once knowing and realizing it, they will co-operate to the letter with you. Now this co-operation must not only be in willingness to carry out your instructions to the letter, but it must also be to the extent of their ability—willingness to pay you for your effort. I know we all do a certain amount of charity and we are glad to do it and all that; it goes without saying if anyone cannot afford to have it done we will do it for him for nothing provided there are not too many to take too much of our time, but a legitimate amount of it we are

always glad to do for nothing for the deserving, but there are a whole lot of people who don't have it done because they think it costs too much, when a very little reasoning will convince them that it is money well invested. It is a strange thing that people will pay as much as \$200 to have a bridge placed to restore teeth that they have lost from pyorrhea, which probably could have been saved for \$25. That is what I mean by making your patient intelligent as to what you are going to do and what can be done for them, and you will find that a great many whom you think won't will do it.

The next thing in the treatment of this so-called trouble is the instrumentation. I don't care what the cause of pyorrhea in its various manifestations may be, the most important thing in the treatment of it is the instrumentation, and *don't you forget it*. I don't care whether there is calculus on the root or not, wherever the root has lost its attachment and there is a pocket, that root surface needs to be cleaned and polished. Without it there never was and never can be a single success. The instrumentation, then, is the first essential so far as you are concerned.

Instrumentation presents three difficulties. First, the difficulty of having instruments which will reach every surface of every tooth—instruments so shaped, I mean, that they will reach all these surfaces and do practical work.

The second difficulty is in our finger training, which will enable us to know by the sense of touch where the rough surface is and the deposit is. Having located it, the sense of touch which will enable us to know that we have removed it and made the root smooth. This does not come by sitting and dreaming about it, fellows. There is only one way you can get it. You can look at books until you are black in the face; you can stand and watch me do it for forty years; you can never get it that way. You have to practise it. Finger training that begets the delicate touch essential to the treatment of this trouble only comes by practice—no other way.

The third difficulty in the way of instrumentation is the pain incident to doing it. There are a lot of instruments in the market designed for the purpose of cleaning and polishing various surfaces of the roots of the teeth. The best set of instruments, according to my understanding of this thing, for this purpose is a set of instruments invented by Dr. Carr, consisting of 150 instruments; but these present great complications, which are hard to surmount for the man who is not giving his whole time to the use of them. There is the Younger set of instruments, the Kirk set of instruments, the Cushing set of instruments, the Tompkins set of instruments, which are excellent; the Harlen set of scalers, D. D. Smith's, Good's—all of which are good. A set which I got up myself, which combines some of the good points of all of these, I think is pretty good, but I find that personally I do best by having a few that meet my particular needs from all of them. Don't buy sets of all of them,

because that is a waste of money, but pick out what will suit your hand best. Having the instruments to work with, and realizing that the important thing is to clean and polish the tooth surface, let us be about it and see what are the essentials to enable us to do that.

First, concentration of effort on one particular surface of one particular tooth until it is done. You cannot clean teeth in a pyorrhea mouth by skipping about from one surface of one tooth to that same surface of another tooth; or, in other words, cleaning all the particular surfaces of all the teeth that one particular instrument will do. I want to clean one spot, and when that is done pass around the tooth, little by little, changing instruments as often as may be necessary to reach the various angles of that tooth, cleaning one tooth at a time. I tell you, fellows, we fail because we don't concentrate our effort on what we want to do. Let's find out what the particular trouble is at this particular point, and let us remove that trouble if it takes all day. I am telling you things which I have learned by a thousand mistakes—more or less. That is the only way you learn it. Take the next spot and do that; and when you have one tooth done let it be done to the best of your ability, if you only do one tooth at a sitting.

The next thing we have to surmount is the hardness of deposits—the difficulty of removing these deposits. Sometimes they are as hard as the tooth itself. To overcome that some things have been suggested, and personally I have found very great advantage in treating such surfaces freely with phenol-sulphonic acid. Others have found success in the so-called tartar solvents, but personally I have the best success with the former. How do I use it? I use it by packing the deep pocket with a rope of cotton saturated with this preparation and leaving it for twenty-four hours, and on those surfaces which are not covered with gum tissue simply drying the surface, keeping it dry and soaking it with phenol-sulphonic acid. Keep it dry for a minute or two succeeding the application of phenol-sulphonic acid. Do that two or three times on successive days and you will be surprised how easy the deposits can be removed. A case illustrating this, of which I have had many counterparts: A gentleman presented for his first sitting with both salivary and serumal calculus covering the necks of all of his teeth, well under the gums, which had receded to, in some instances, half of the length of the roots. I started in, as is my custom, with the lower right third molar. I spent two hours on it and I hadn't it cleaned, and I stopped because I was absolutely tired out. I couldn't get the deposit off except by filing it off. I then abandoned that plan, and for three times, allowing a day to intervene, I applied the phenol-sulphonic acid in the manner I have suggested to you, taking one tooth at a time and going all around the mouth at each sitting. The next sitting for cleaning his teeth I scaled all the rest of his teeth in an hour. Two hours for one tooth, and all

the rest of the teeth in an hour—and he had them all—showing what the acid did. This time I flaked off all the tartar on one surface of one tooth with one stroke, instead of having to file it off with a smooth file.

With regard to the inaccessibility of the deposits. I find I can simplify that by packing the gum away with the rope of cotton, using 50 per cent. phenol-sulphonic acid. Draw out a thin rope of cotton saturated in the acid, dry out the pocket first, keeping it dry; then feed the rope of cotton down in, and pack it and crowd it in until you have crowded the gum back and made it white from the crowding. The acid is enough of an anesthetic so that there is no pain about it. When the patient returns and that rope of cotton is removed, in twenty-four or forty-eight hours, the gum stands away and you can get in and clean the deposits with the greatest ease. Sometimes I may have to pack them twice to accomplish this result.

Another method of simplifying the operation is cutting through the gum and getting into it that way, as illustrated in Fig. 31. With regard to the pain incident, I control the pain in bad cases—and it is only in bad cases that I have any trouble with the pain—I control it first with the phenol-sulphonic acid, because the reason it hurts is because it is under the gum; so I overcome that by lifting the gum away, making room for the instrument, and it does not hurt so much. The next thing, after removing the packing of phenol-sulphonic acid, I pack it again with cotton saturated with cocaine in solution. I crowd it down with cotton and keep it dry for a minute.

I don't have one patient in fifty complain of the pain. Because I take this means of avoiding it. Now, use any cocaine preparation you like, but experience has taught me, gentlemen, not to inject the cocaine. I know some operators do inject it into the gum. Others inject it into the pocket. You will get better results by the method I have suggested, and avoid the danger of carrying the injection deeper into the tissue with the pressure incident to forcing it in with your syringe.

I had a very splendid object lesson, and I will stop to tell you that, with regard to the dangers of forcing cocaine into the gum about pyorrhea pockets. A gentleman from out-of-town presented himself at my office one day with pus discharging from five places about his neck and lower jaw on the right side, outside, discharging on the face and neck, all done up in bandages. A dentist of international reputation attempted to scale the tartar off a lower right central, where he had a pyorrhea pocket, and to overcome the pain he injected cocaine solution into the tissue, and through that injection carried the infection in under the periosteum, with the above result. When he came to my office he had lost all the teeth back to the third molar. A cure was only effected after the removal of most of his lower jaw on that side.

The next thing is, after the teeth have been properly scaled, they should be thoroughly polished. I tried to give you an exemplification of what is meant by the thorough polishing of teeth at the clinic this afternoon. Thoroughly polished with wooden points in port polisher, using pumice. Then, following that, the pockets are to be irrigated and cleaned of everything foreign. The after-treatment consists of the application of such astringent antiseptic agents as may appeal to you. If I have a great deal of pus to contend with I usually use phenol-sulphonic acid every third day for a while until the pus disappears; but if, on the second visit, the patient presents with free-flowing pus, out of some pocket, I conclude that my first work of instrumentation and polishing has not been successful, and I repeat it. I believe more in the polishing of exposed surfaces of roots than I do in medication. Then, if the tooth neck is particularly sensitive, either before or following the scaling, and polishing, I get rid of that sensitiveness by further polishing. Gentlemen, take the first case that comes into your office where the neck of the tooth is sensitive—not decayed, but sensitive—and polish it for fifteen minutes with wood points and pumice stone, moistened with deliquescent chloride of zinc, and you will do away with the sensitiveness. Perhaps the second time will be needed. In the use of deliquescent chloride of zinc it is necessary to have the gum dry. If the gum is dry it is not escharotic. Then, having polished the diseased tooth neck that way, I wipe it off dry and wash off the little remainder. Then, without the use of pumice stone, I often make use of the chloride of zinc with the wooden polisher about the neck of the tooth to overcome the sensitiveness following scaling and polishing. If I find the case does not yield quickly to that treatment, I switch over to the 40 per cent. trichloroacetic acid, then back to the chloride of zinc, finding the alternation of these two act very nicely indeed. My stand-by is the Talbot remedy, glycerol, iodine and zinc. I have posted it there on the Bulletin Board. I apply that freely into the pocket and on to the dry gum, keeping it dry for a couple of minutes after applying it, and then wiping the excess off, washing it off with antiseptic warm water, and I apply that every other day to begin with, then every third day, then every fourth day, then once a week, then once in two weeks, then once a month, running out of it that way. In addition thereto, I rely upon massaging the gums a great deal, the method which I illustrated in the clinic to-day. The important thing in massaging the gums is to force the gum back to its natural normal position and enough irritation to stimulate circulation.

Other remedies that I make use of in the treatment of these diseases locally are 40 per cent. trichloroacetic acid, to get rid of fungus growths and hypertrophied gum tissue; the application of resorcin crystals to relieve the sample cases of gingivitis; the use of powdered alum as an astringent where the gums are loose around the necks of the teeth; the use of oxide of zinc alone for its

astringent property, in many cases; the use of the tincture of iodine where there is a simple inflammation without pus—I mean without pus in the beginning, just those inflammation cases which are not pus cases. Don't tear open healing pockets. Let medicines flow in.

Now, is there anything else to be done in the treatment of this pyorrhea? Yes, a very important thing. All loose teeth that wiggle about in their socket must be made stationary. All imperfect contacts, overhanging fillings, ill-fitting crowns—in short, all in-harmony in the mouth, must be reduced to a normal state as nearly as you can. The methods of splinting loose teeth are many. I am sure you are familiar with a hundred different schemes. Any one that will suggest itself for the particular case in hand is the one to use. Where I simply want to retain the teeth temporarily while treatment is going on, and expecting they will hold themselves after that, I make use of the silk ligature entirely, but that requires a great deal of practice in knowing how to tie it. I use the Number "A" white sewing silk. I wax it, and with a little experience you will find you can tie teeth together by wrapping around one tooth a couple of times and knotting it, and then around its neighbor and knotting it, and so on, retaining three or more of them together, and where the ligature has to pass around molars and bicuspid which are smaller under the gum than they are at the contact point, it is necessary to run a loop of it up over the occlusal of the tooth as well; not only do you tie it around below the contact point, but you have another piece of silk coming up over the occlusal to hold the ligature from slipping gumwards. It is very simple to do. You practically just lay the pieces of silk which you are going to use for the occlusal on the occlusal from mesial to distal, and, prying your other piece of silk through between the proximal surfaces, the ligature will carry that other piece of silk with it; when the ligature is tied around the tooth bring the two ends which are under the ligature over the occlusal and lift the ligature toward the occlusal and keep it from slipping towards the gum. A ligature of that kind will usually stay on a month without taking it off or it cutting through. Other methods, I use wire; and other times I make little gold bands and platinum bands—just thin, gauge 36—cement them on for the time being. Where the teeth are very loose and require permanent supports I use splints; I use inlays and Carmichael attachments often. In incisors I use staples quite often. In lower incisors I use pins running from the linguals to the labial with backings on the lingual of the tooth, solder backings to pins and cement them on and leave them on permanently. If the teeth are pulpless I run the pin into the pulp chambers. Pulp should be removed from excessively sensitive teeth, those that cannot be permanently relieved by obtundants.

All loose teeth must be made permanent in the socket. If you have a tooth which is so loose it is hopeless, take it out. Never

dismiss a case with a contaminating pocket in it. Get the tooth out of the mouth rather than leave it if it is semi-useful, if it has a general system is concerned, relates to elimination. The majority contaminating pocket, because it will spread surely. I have lots of cases where I have eradicated pyorrhea from the mouth permanently by taking a tooth out. I have had a case where it affected the two upper first molars treated by half a dozen men before it came to me; it was hopeless before I saw it, and I insisted on her having them out. They were useless teeth and she had them out and we supplied the need with a bridge later on, but in twenty years she has had no return of pyorrhea. If I had left those teeth half cured in the mouth she would have had pyorrhea everywhere, long ago, and probably lost all of her teeth long ago.

Now what else? Is there anything else in the general systematic conditions which pertain to pyorrhea, the correction of which is necessary to a cure? Well, I will answer that this way: There never was a case of pyorrhea cured by systematic medication, diet attention, alone; yet all cases of pyorrhea can be benefitted by attention thereto. Now what do I do? Of course there are some cases of pyorrhea that have, as a complication, and perhaps even a feature, in the original cause, such diseases as diabetes. Usually recognizable in the mouth by the many little discharging sinuses, which look like alveolar abscess discharges. They are usually noticed by that. Then there are other kidney diseases which act as a complication in pyorrhea cases, there is no doubt; but let me include them all under one general term, which for our purpose does very well, and say that the important thing so far as the and the fresh fruit will cure absolutely every case of constipation of pyorrhea cases are poor eliminators. They are retaining in their systems poisons which Dr. Talbot calls auto-intoxications, toxins which are being eliminated by the various excretory organs, including the mucous glands. Therefore, in bad cases of pyorrhea I require the patient to go on a rigid diet to begin with. I have them cut out the eating of meats—not so easy to do, perhaps, as it might sound. Allow them fish, all they want; lamb chop well cooked; the breast of chicken, all they want; ham and bacon, all they want; but not red meats. The nice, juicy, luscious steak and roast beef are not conducive to good elimination. I have them cut out excessive sweets. I have them take increased quantities of fresh fruits, particularly the apple and orange. You will find you can pick out a fine diet for people if you will just take a little pains, a varied diet they can get along on fine. Then, in addition to that, I see that their bowels are cleaned out to start with. And their kidneys are stimulated by the drinking of increased quantities of water. The human race, as it exists on this continent, is suffering from the lack of water. I do not know of many people who drink enough water. It is said that the North American race is a constipated race—literally true. We are being poisoned through our own

intestinal tract. There are exceptions, but I am telling you the rule, and you will find your pyorrhea cases are no exception to the rule. You will find that the drinking of eight glasses of wholesome water, aside from what they take at meals, every twenty-four hours, and poor elimination. And not only that; I encourage such individuals to take exercise in the open air. Perhaps in Winnipeg you don't need to do that as much as we do in Chicago, but you know we have hosts of people in Chicago who never take any physical exercise at all to speak of. They eat heartily, bolt their food as a rule, without half chewing it, and the result is they don't assimilate what they eat and they are filled up with poisons which are not eliminated. Now, let me tell you, gentlemen, that if you will start that regime with your most fashionable pyorrhea patients, the ones who think they are having to give up a whole lot in having to give up their sweet tid-bits and all that kind of thing, you get them to go on your diet regime for one month and you couldn't drag them away from it. Why? Because they feel the effects of it. Their eyes clear and their complexions clear, and they have a robust health which they never experienced before. Now that is the line of thing that I require, and I find they fall into it without a single complaint. They may think they are giving up something, but as they try it a little while they find that whereas they were taking medicine all the time for alimentary troubles—troubles of the alimentary tract—they are all gone; they don't use any medicine at all. You have cured them of chronic constipation; you have cured them of kidney trouble, acute rheumatism every time, while you are curing the pyorrhea.

Gentlemen, this may sound like a lot, but it is not, and it is worth while. You will find you will be abundantly paid. One pyorrhea case whose mouth and system is returned to normal condition is the biggest advertisement for you that you can have.

Mouth washes and so forth, and so forth, that go as an aid, are important for two reasons. First, the intrinsic value of the wash; and, second, as a stimulant to the patient to take care of their mouth. I think we all owe it as a duty to our patients, particularly the pyorrhea patients, that we give them specific instruction in the care of their mouth and how to go about it; how to keep their teeth clean and polished. You know without my telling you that there is not one in twenty that comes into your office that knows how to brush his or her teeth. If you will examine the patients' mouths, give them a mirror and show them where they are not cleaning their teeth, show them how to do it, how to use their brush, the kind of a brush, and wholesome tooth powder, or tooth paste, to stimulate them in cleaning them, although the powder and paste isn't essential. If they have a good tooth brush and good cold water they have all they need. I have indicated some mouth washes on the board that are of good value. There are a good many mouth washes on the market which are good and have some value to them. When

the case is dismissed I ask them to return every three months for examination.

If there are any questions you would like to ask I shall be glad to answer them if I know how.

DR. BUSH: What guage of platinum wire do you use for your staples?

DR. MAWHINNEY: Where I have room I use 18; where it is a pretty close bite I use 20 or 22.

DR. GARVIN: You spoke of using water in Winnipeg. In Winnipeg we have artesian water, which is recognized as being very hard and containing considerable lime and salts of different kinds. Would you say that would be harmful in any sense, and what would you prefer—distilled or spring water?

DR. MAWHINNEY: I would prefer a spring or a distilled water.

DR. GARVIN: In the case you spoke of, of diabetes, and another type of case, a nervous type, and perhaps lungs affected and anemic conditions, would you expect to cure a pyorrhea condition?

DR. MAWHINNEY: Not without the aid of the physician.

DR. GARVIN: The physician in these cases has not been successful.

DR. MAWHINNEY: Why not?

DR. GARVIN: Well, the state of the diabetes, which we will say is almost incurable, from the physician's standpoint.

DR. MAWHINNEY: If it is an incurable case of diabetes, or tuberculosis, or Bright's disease, or Addison's disease, that has gone beyond the power of the physician, then, of course, the case is hopeless as far as you are concerned.

DR. GARVIN: In the case of removing the root of the molar, shouldn't that tooth be removed?

DR. MAWHINNEY: Not if the buccal roots are firm. I have saved hundreds which have been going fifteen years or more. Of course it depends on the attachment of the remaining roots as to what you should do.

DR. BOWLES: In making the inlays, do you run down on the proximal surface?

DR. MAWHINNEY: I make the two separate inlays and solder the mtogether.

DR. BOWLES: And carry one down on the gingival margin?

DR. MAWHINNEY: Yes, just as you would do to preserve the contact.

DR. BUSH: Do you use pins?

DR. MAWHINNEY: An inlay for retention, perhaps if you could tuck a pin in around you would increase its efficiency very materially. Of course, if it is a pulpless tooth you could always use a pin, and if it isn't you can sometimes get a pin tucked in somewhere. I sometimes make an inlay with two little pins if they don't go but a very little way into the dentine; with a thread cut on your pin it retains the inlay better.

DR. GAVRIN: Would you leave the root of a lower second molar in the case of a root amputation—the apex?

DR. MAWHINNEY: No, sir; I would take the whole root off instead of resecting it.

DR. GARVIN: What teeth would you advise the amputating process?

DR. MAWHINNEY: Personally, I have not had any success except in single-rooted teeth.

DR. MANSFIELD: What is the proportion of sulphuric acid and phenol?

DR. MAWHINNEY: The proportions are about 40 and 60 per cent.; but I don't attempt to make it. Buy Merck's; you can get Merck's in this country. Merck's sell theirs under the name of sulpho-carbolic; you cannot unite it except you have the chemically pure drugs, and then at a definite fixed temperature, all of which I might write out for you. I made it and gave the formula to Merck's; they make it from my formula. It is such a difficult thing to make, that they won't combine unless you get them just right, and if you don't get them just right they will explode if you put water in it. Properly made, they are soluble in water. You can get a bottle for \$1 that will do you for years. Tell your druggist to get a bottle of Merck's sulpho-carbolic acid.

DR. MAWHINNEY: A fine broach with a shred of cotton wound on it is a very nice thing to detect whether you have your root clean or not. Put a little shred of cotton on your broach and if there is any roughness there your cotton will catch it, and it is a nice thing to know if you have it clean or not.

DR. FITZPATRICK: What is the treatment where the gum will recede, and process is gone and there is no pus, in the lower anterior teeth, generally?

DR. MAWHINNEY: The treatment in that case of atrophy of the tissues. That trouble is brought about by the loss of the resistance of the local cells, which can only be cured by stimulation—massage and the use of such agents as applications of Black's 1, 2, 3, and that sort of thing, and the diet, just as in the other.

DR. CAMPBELL: Will the X-ray show the deposit on the end of roots of teeth?

DR. MAWHINNEY: It usually will appear as a roughened, irregular outline only.

DR. CAMPBELL: Not dark?

DR. MAWHINNEY: No. The tartar reflects the X-ray light just about like the tooth structure does.

AA vote of thanks was moved by Dr. Banning, seconded by Dr. Bush, for the very interesting and instructive address given by Dr. Mawhinney.

Dr. Mawhinney, in acknowledging the thanks of the Society, said: "Mr. President, in closing I would be very ungrateful, indeed, if I did not express the appreciation of the feeling you have all

assured me you entertain for me, in the thought you express that I may have been helpful to at least some of you. I did not come all the way from Chicago just to show what a fine-looking fellow I am, but rather with the hope that I might bring a message which would be helpful to you in your everyday work. That is what life is for, to help one another; and without this helpful spirit we never would get anywhere. Bless your heart, no one is so great but he can learn something from the humblest, and not wishing to place myself in the category of the great—for I certainly do not feel that I belong to that class at all—yet, with Emerson, I can say truly that every man I meet is my master at some point, and of him I learn.

I thank you very much for your hearty reception; for all the kind things you have said; and I want you to remember that whenever I can do anything for your good at home you have only to call on me. The joy of life is to bring help to someone in need of it.

A CONTRACTION LOOP IN ORTHODONTIA.

J. B. MORRISON, D.D.S., MONTREAL, CAN.

Presented before the Montreal Dental Club in May, 1911.

Among the multitude of cases of mal-occlusion of the teeth, for which treatment is required, there seems to be an astonishingly large number where abnormal spaces exist between the upper incisors teeth.

The principal causes of this condition are:

First.—Abnormal frænum, causing a varying width of space between the central incisors.

Second.—Mouth breathing, causing, through lack of muscular pressure, a protrusion and consequent separation between the incisors.

Third.—Habits of sucking or biting the lower lip, a muscular influence bringing about practically the same position of the teeth as mouth breathing and often associated with it.

Fourth.—The tardy eruption of the permanent canines, these teeth remaining deep in the alveolar process long after the absorption of the roots of their temporary predecessors; this permits the permanent laterals to drift into the canine space further retarding their eruption.

It must be obvious to all that the ideal time to close up these spaces, is before the eruption of the permanent canines, as these teeth afford the normal retaining influence by their eruption into normal approximal contact with the laterals.

The majority of these cases require in treatment the use of the expansion arches, both upper and lower, but the contrivance which I have used considerably, and which I call a *contraction loop* can be used to great advantage in conjunction with the expansion arches,

and is quite sufficient in itself to correct many cases, particularly cases from first and fourth causes mentioned.

The principle of the appliance is readily seen in illustration, Magill bands of iridium-platinum are fitted to the laterals, and iridium-platinum wire 18 to 20 gauge is fitted to model with bands in position and loop made as illustrated, at median line, or two loops can be made if necessary.

The wire is then soldered to bands and cemented on teeth, and with a pair of fine forceps or wire cutters the loop is gradually contracted, enough pressure being given at each visit to whiten the inter-proximal tissue.



When the loop is closed, and if further contraction has to take place, the bands are removed in an impression, the wire taken off, and loop opened and resoldered, the appliance is replaced on the teeth and the same procedure continued.

This principle of applying force has proved very effective in my hands, is delicate in appearance, painless in operation, quite secure from accident, and when contraction has taken place is an ideal retainer.

Rotation of centrals can be accomplished by ligaturing with bands and spurs or ligaturing direct to wire on either side of loop.

This loop principle I have also used to advantage in other orthodontia work, rotating bicuspids, retracting canines, etc.

The extension hooks in illustration are for intermaxillary elastic bands in treatment of protrusion cases and class II. cases of the Angle Classification.

Another advantage of the contraction loop is that the soldered attachment to bands on incisors gives stationery anchorage, and

the teeth must move more or less bodily through the alveolus and not tip together as when ligatured.

This feature can be utilized to advantage in reinforcing anchorage as by soldering to band at one end and simply hooking on to a spur at other end, the movement is then practically confined to tooth with the loose attachment.

PRESIDENT'S ADDRESS.

J. H. IRWIN, D.D.S., COLLINGWOOD, ONT.

Read before the Ontario Dental Society, May 31, June 1 2, 1911.

Gentlemen,—

In preparing the customary annual address of the President, two topics both relevant and interesting have been omitted—the progress made in recent years in our profession, and the value of attending society meetings.

For information regarding the former you may refer to the current number of our dental journals, and for the latter you may recall your own personal experiences, since the gain resulting from attending these meetings depends largely on the individual, and nowhere is it more plainly shown that in helping others we help ourselves.

Instead of dwelling on the pleasing subject of the almost dazzling progress of the past two years in matters pertaining to dentistry and of giving vent to the usual wail at the very moderate enthusiasm and tardy recognition shown by the masses generally in the marvellous works we are capable of doing for them, let us rather consider what we have done to make our ways known unto them.

The profession of dentistry labors under two disadvantages in receiving the recognition financially and otherwise to which we think it is entitled. First, modern dentistry is young and, besides, is having a remarkably rapid growth, a growth so rapid that every opportunity afforded by clinics, practitioners' courses and dental literature has to be taken advantage of, by the dentist who wishes to keep pace with the scientific discoveries and improved methods.

What are we doing as a society or as individuals to acquaint the public generally with our progress and increasing usefulness?

A splendid work of an educational nature is being carried on by the educational committee of this society assisted by the Canadian Oral Prophylactic Society, consisting of arranging for lectures and supplying lantern slides, distributing literature, advocating the examination of school children's teeth, and other methods having for their purpose the instruction of the people in the value and care of the teeth. Excellent as this work is, it is necessarily slow in producing satisfactory results among the masses, for, as the late Dr. Barratt said: "It would seem that when once an impression con-

cerning a matter of dentistry gets hold of the public mind it is almost impossible to eradicate it no matter how absurd it may be;" and it is not necessary to remind a gathering of dentists of the many errors and false conceptions of dentistry which exist, even among the educated and refined 25 per cent. of Ontario's population who use dental floss and visit our offices.

What then are we to think of the remaining 75 per cent., the great majority, who may know of teeth and their value, but nothing of dentistry and its possibilities? I would draw your attention to the likelihood of this percentage being increased unless some vigorous measures of publicity are adopted. This province is losing to the Canadian West, thousands annually, of the most progressive and intelligent native-born population, and, as we are destined to become more and more a great manufacturing province, the loss in our native-born will be more than made up by a class of workmen from lands where dentistry for the masses is unheard of.

Many of the writers in our more recent journals devoted to the cause of dentistry, have been advocating systems of using the press to "advertise dentistry without advertising the dentist." and this society some 10 or 15 years ago discussed the advisability of some such procedure to combat the growing tendency of the unethical dentist advertising his bargains, and I would advocate it now that we may extend our sphere of usefulness among the acknowledged large percentage of our population who, mainly through ignorance of what dentistry really is, continue to neglect these important organs. It seems timely to advocate it now, knowing that every conscientious dentist has daily reason to deplore the fact that his patients are suffering irreparable loss due to this want of knowledge in these matters, and it seems timely to advocate it now, as the people of Ontario by various ways are receiving instruction on the value of their dental organs through sources hitherto unused and the value of proper mastication as shown by the experience and teaching of Horace Fletcher has so impressed the people of this continent that his name has become a household word and he numbers his disciples by the million. And, as we are engaged in this useful work of restoring, repairing and preventing our methods and attainments will suffer nothing from publicity, nor will profit accrue by their being shrouded in a mantle of mystery.

In an excellent paper read by Dr. C. B. Warner before the Illinois State Dental Society he suggested a plan which, in part, is as follows:

"Let a committee of the State Society select 50 popular articles on different phases of dental education that will be readable, instructive and not too long. These articles should be given to a press service who make it a business to put this matter in plate form, using such illustrations as may be necessary. They will send the articles to the publisher and attend to all detail work. It has been found that 95 per cent. of the newspapers will print matter furnished this way.

From the nature of these articles the reader forms the opinion that it is news gathered by the paper as they are unsigned, and anything tending to advertise a person, method or article to any one's advantage is strictly eliminated. Dentists would find that money spent in publishing these articles would not be to get practice from each other, but to enlarge the field."

It would be advisable for this society or the profession to attend to this use of the press to prevent the erroneous teaching which is sure to result if left to individual efforts, in the production of articles and pamphlets.

It appears to me that the newspaper is not only a ready means of reaching the masses, but it is well known that useful knowledge acquired by one's own effort makes more impression and is more likely to be applied than the spoon-fed variety served up in lectures and booklets.

At every meeting of this society which I have attended in recent years complaints have in some parts of the discussion been made of the dentist not coming to his own, forgetting that the general public has no conception of the advance this young profession has made in one generation, "and how can they know if they have not heard, and how can they hear without a preacher?"

Such articles should be prepared in a readable, interesting form and in addition to the general phases of our work there should be articles giving accurate information concerning the educational requirements necessary for entering the profession, the time spent in completing the course, the general equipment necessary for a modern office. After reading these it might dawn on the man of average intelligence that a dentist should be as well equipped to treat a diseased condition of the oral cavity caused by neglected teeth as a fledgling from some medical college. General information of what we should be able to do for our patients would act as a stimulus on us to keep well informed in our profession to meet the demands of an ever-increasing intelligence on the part of our clientele. It would make necessary an increased subscription list to our dental journals, an increased attendance at society meetings and clinics, and a great demand for practitioners' courses.

This society has reason to congratulate the profession in this province upon having such an admirable Dental Act and we should especially congratulate our Board of Directors upon their success in managing unethical practice in their jurisdiction.

For a number of years there has been a growing tendency in the dental profession to do away with teaching dentistry by means of a preceptor. A few years ago the Board reduced the compulsory preceptorship from 15 to 5 months. During the past year the directors very wisely arranged to have the dental infirmary of the college open during each summer for the instruction and practice of those students who desired to remain in Toronto and were willing to accept the Dental College for their preceptor. About twenty-five

students have accepted this opportunity this year. They are under the direction of Drs. Stewart and Fife. The profession of Ontario looks on this as a forward step in dental education besides giving an opportunity for those unable to pay for regular dental services in Toronto to have dental operations performed during the summer.

There is another matter on which our profession cannot be congratulated. We are constantly reminded by experience and observation of the narrowing tendency of our calling if followed too exclusively and to counteract this it has been recommended that we cultivate some useful hobby that may result not only in broadening us, but in adding something to the sum total of useful knowledge. There lived a dentist in the city of Toronto whose efforts outside of his profession secured for him a professorship in the University of Toronto and a continental reputation. I refer to the late Dr. William Norman Brodie, the great entomologist, whose memory we have yet neglected to honor, though our attention has been directed to it by forcible articles from the editor of the *DOMINION DENTAL JOURNAL* and Dr. M. P. Corrigan. It seems strange that while we have been bemoaning the fact that our confreres have not shone more often in literature or affairs of state, we have allowed the fame of this brother dentist, the greatest entomologist that Canada ever produced, to go unrecognized. It is not too late, and let us hope that your next President will be able to report that the profession has honored itself by honoring the memory of this great man.

DISCUSSION.

DR. SMITH (Cornwall): Mr. President, having been called on, I am here, but I was not prepared to discuss the address of the President. However, I think with the Vice-President that the President has struck a note which should stimulate us to some discussion. Unfortunately for myself I am not as capable of discussing it, as I am sure many of the members present are. Some of the features of his address are particularly worthy of discussion, and I think are beyond criticism. I have nothing further to say.

DR. CLEMES: Mr. Chairman, there are two or three points in connection with this very eloquent address which I would like to touch on, but before I touch on anything in connection with the address I would like to say two or three words in regard to our President, and I would like to congratulate Dr. Irwin on occupying the position of President of the Ontario Dental Society, the highest honor to be given in the profession, and I don't think the honor could fall on any person more worthy than the doctor is to occupy the position. The doctor comes from the same town as myself, so that I have known him for a number of years. He is a good fellow and he is a good citizen. He speaks in the latter part of his paper about having some useful hobby. That is all right, something I perfectly agree with. Some of our confreres perhaps have become famous by having a hobby outside of their dental profession. However, we all perhaps cannot have hobbies, but we can all be useful

members outside of our profession, and the doctor is one of those who makes a good citizen. He has been a member of our School Board for a number of years; he has been Chairman for some time and has filled the position with credit to himself and with profit to the educational interests of our town.

Now, with regard to some of the points in connection with the address, he speaks about not receiving remuneration financially as we should. We have not been brought before the public perhaps well enough financially, and when he says anything like that perhaps it touches a cord in all of our feelings. When we consider the education which a person must have to matriculate; when we consider the time which the course takes and the expense and the amount of money which it takes at the present day to fix up a modern dental office, perhaps most of us feel we are very poorly remunerated sometimes for the amount of work and time which our services have entailed. Besides this, whereas the cost and expense of living has increased much during the last few years, our remuneration has not perhaps increased proportionately.

Then, again, the President speaks of the profession not being fully advertised. Well, there are many of our people moving to the west, some say, and perhaps the people of Ontario are as well educated along dental lines as the people in any other part of the Dominion or any person outside of the Dominion. The people of Ontario are moving away to the west, and there places are being filled by others from the Old Country and from foreign lands. Now, in my own practice at home we have a number of foreigners, a number of emigrants. We all think or we have been accustomed to think that the people of the Old Country have good teeth, better than Canadians have. My experience with foreigners, my experience with Old Country people is that they have not got nearly as good teeth as Canadians have, native born Canadians. Those people have never had any dental education; they have scarcely had any dental work done, nothing more than perhaps the extraction of a tooth. Those are the people we want to get at and want to teach what modern dentistry can do for them to preserve their dental organs, to preserve their teeth for use in mastication and for general appearance.

DR. READE: Mr. President, I would like to say one word regarding a certain part of the address, that is the latter part, although all the parts give much food for consideration in the way of the education of the public. However, in the latter part, he refers to Dr. Brodie, a dentist who lived in our city a short time ago, and it was in regard to having some memorial for Dr. Brodie that I wished to speak. I can't very well see myself how it is possible for us to do otherwise than have a memorial for Dr. Brodie in this building, because I know of no other man in Canada who has attained the same standing as Dr. Brodie as a scientist, and we should be very glad indeed as a profession and very glad indeed to

point out to those visiting the college who Dr. Brodie was, and that he was a member of our profession. So I will be very much in favor of doing anything possible towards a memorial for Dr. Brodie, which I really think should be in the form of a portrait hung on these walls.

DR. WEBSTER: Mr. President and Gentlemen, I desire to say something along the same lines as Dr. Reade has just spoken. It is rare that we have at any time such an opportunity to honor a member as the Ontario Dental Society has at this time. It would be an advantage to the profession to have such a portrait. It is an advantage to the students who come into these halls to be able to look about the institution and see the portraits of those who have gone before and who have done great work for the profession. It draws the student and the profession closer together, to recognize the work which such men as Dr. Brodie have done. Those of you who have visited the halls of learning in other countries will notice on the walls many portraits of prominent men who have been in connection with the institution. At the same time you can study the history of the institution from the portraits hanging about, and I think it would be a great advantage to this institution to have a portrait of Dr. Brodie as a stimulus to others to advance along special lines.

I wish to congratulate the President on preparing an address with only a few things in it and discussing those fully. The part in connection with public education ought to be left in the hands of some of the members of the Education Committee to discuss, or ought to be laid before them to take up and study the pros and cons of that particular part of the address. (Applause.)

DR. ROBERTS: Mr. Chairman and Gentlemen, one of the objects I had in attending this meeting on this occasion was to congratulate the Educational Committee, situated in the City of Toronto, on the excellent work they have done; also to congratulate my friend, Dr. McLaughlin here, on the articles he has been writing in our Journal; and before I discuss the questions that have been referred to in the eminent address of the President I wish to congratulate the President on the exalted position to which this Society has elected him, and also to congratulate the Society upon having elected a man who has such a clear insight into the matter pertaining to our profession.

I regret that the acoustic properties of this hall are such that it is almost impossible to hear at any distance, but when I see these marks on the ceiling it reminds me of years ago when I would have been very glad to kick a football up and make an indentation of that kind, when our building was situated on the corner of Victoria and Richmond Street.

Our President has laid before us the recognition of our profession, making the public thoroughly acquainted with certain facts by way of advertising judiciously through the press. Now, I think

the work has been admirably started. I think the public should be thoroughly educated in these matters, and in my own experience there is one point that stands out more glaring than possibly any other, and that is the ignorance of 50 per cent., if I may say it and be safely within bounds, of the people at the present day with reference to the fact that the permanent molars in the child of six years are not thought to be permanent teeth at all. We all know the disastrous results that arise from such ignorance. Those who wish to restore the mouth to a normal, healthy condition will find that, owing to the loss of these valuable teeth, their services are not nearly so successful as though those teeth had been in good condition. That is one point that in time will be taken up as a matter of instruction in almost every community, whether native or foreign. Education and instruction will not hurt anybody. I hope we as a profession have got beyond this point when we may with freedom discuss with those within the sound of our voice the benefits to be derived from judicious work within our own profession without thinking we are speaking for our own pecuniary advantage. With reference to the fees that are charged for things of that kind, that can easily be adjusted by every man. I don't ask any man what I am to charge. I charge what I think is right, and I think every one should reach that stand. It is better to do nothing than to work for nothing.

In reference to the education my friend has spoken of, I think it should be the aim of every intelligent man who is practising dentistry to benefit the community in which he lives. If he have business abilities or educational attainments he should be willing to devote his time and energies and attainments for the benefit of the community in which he lives as well as for the welfare of the state. These objects, if they are properly carried out, will be of advantage, not only to the individual, but to the profession which he represents, and will result in untold benefit to the public. I am glad to see all over this province that our men are taking a prominent stand as far as municipal affairs are concerned, as far as educational interests are concerned and in the communities in which they reside. There is no reason why we should not. Our education is or should be the equal of the education of any man in almost any profession. Our matriculation standard has been raised, and I believe it will be raised to a higher notch in the years that are to come. A university education is not necessary for this or for any other work, except possibly purely literary work. Now, I may state, some years ago it was my privilege at a convention that was held in the City of Syracuse to hear Dr. Beers deliver that celebrated lecture of his on "Why We Should Not Be Annexed to the United States." Dr. Beers was a man gifted with a great deal of literary ability. He used all the literary ability he had to show that assemblage why we should not be absorbed by the United States at that time. I am not stating this with any reference to

reciprocity, but he spoke and he showed the profession over there that the men in this country were worthy representatives of this great nation, were men whose literary attainments compared favorably with that of any other country. We have them to-day. It is quite evident from the class of literature we are receiving in our journals at the present time. I congratulate the editors of the journals on their discrimination in selecting and printing these matters, and I congratulate the gentlemen who give their time and careful attention towards sifting out these things. I trust the remarks the President has made in his annual address will be considered carefully and wisely by all the members present, and I think it should be the duty of every member to lend whatever assistance he may be able to give. (Applause.)

DR. M. P. CORRIGAN: Mr. Chairman, I would like to congratulate the President on his excellent address and the suggestions contained in it. Unless we have such ideas as these carried out we cannot possibly be a success, and the profession cannot obtain that place in the nation's life that it otherwise would.

My prime object is to speak of the late Dr. Brodie, a member of our own profession who has done so much as to be noticed over the whole of our continent, in fact to have more than a continental reputation, and in order that some here who have not had a clear idea of the work Dr. Brodie did may know something more of what he did, I would like to give a brief sketch of the man's life and work. Dr. Brodie was born in Aberdeenshire, Scotland, about the year 1832 and came with his parents to Canada and settled in the County of York about 30 miles from Toronto. Here he grew up on a farm, and from early life took a very keen interest in all phases of natural history, particularly in entomology. When a young man he came to Toronto and practised his profession here for something like 40 years, practising on Parliament Street.

Now, it would not be a great wonder if a man who devoted all his life to the study of entomology would be a great entomologist, but for a man who practised dentistry every day for nearly forty years, and in his spare moments made a study of entomology, it certainly seems a marvel that he should reach this very eminent place, doing in his spare moments work along his chosen lines. It is said by those who knew the work of the man well that not only had he a knowledge of entomology, but he was a specialist in almost every branch of natural history. We know of his original work in botany and orinthology. To show you something of the magnitude of the man, let me say his real work, the work for which he will be known in the future, was one in connection with gall producing insects. When I tell you Dr. Brodie collected 18,000 specimens of galls, and made a special study of the insects forming the galls, and the insects that were enemies of these insects, you can have some idea of the enormity of his work. This collection of 18,000 specimens was purchased by the Smithsonian Institute shortly be-

fore his death and taken there, and are to-day to be found in the museum there. I have a letter in my pocket from the chief of the bureau of the Smithsonian Institute, and I would like to read some of it so as to give you an idea of how he is regarded there. This was written to a friend of mine, a botanist over at the University. It says: "I have your letter of the 25th inst. Dr. William Brodie was a man of high reputation among the entomologists of North America and his death is universally regretted. While he did not publish much (that was altogether owing to his modesty) his reputation was very high, and he was known everywhere as a broad, philosophic student of nature. His particular interest in entomology was confined largely to those pathological structures known as galls. He was interested not only in the galls themselves, but in the parasites of those insects. He amassed a large collection of this material which shortly before his death was purchased by this department and deposited in the United States National Museum. It comprises over 18,000 specimens and may now be consulted any time in the National Museum. The specimens all bear Brodie labels and are kept together. I was greatly impressed by his breadth of view and by the soundness of his reason. Sincerely yours, L. O. Howard, Chief of Bureau."

This is only one out of many such letters I have received from prominent men regarding Dr. Brodie.

Shortly after this lot of specimens left our country the Provincial Government became apprised of the greatness of the work Dr. Brodie was doing, and they approached him about his remaining collection, the whole flora and fauna of Ontario, with the exception of the birds and animals. Each of these was labelled with the date and the locality and the proper classification, and it consisted of these: There were 80,000 specimens making up all of the insects of the Province, there were about 1,000 specimens of dried plants, there were about 1,000 specimens of land and fresh water shells, about 500 specimens of reptiles, and along with others they make up 92,500. The commercial value of these specimens was said to represent about \$8,000 in money, but knowing full well that unless some museum or some responsible body would get hold of them before his death the work of his lifetime would be practically undone, he permitted our Government to take them over for the modest sum of \$1,000, and at the same time received the appointment of Provincial Entomologist at the University, and he received during his remaining years something like \$1,000 or \$1,200 a year as his salary. These specimens were removed to the University, and he was put in charge, and spent the remaining years of his life, from 1903 to 1909, further classifying them.

Now, it is pretty hard to estimate the worth of a man like Dr. Brodie, because not only was he a great entomologist, not only was he a great student of natural history, but hundred of young men who came in contact with the man went forth from his presence

feeling the inspiration of meeting such a man. For instance, Mr. Thomson of the University, told me this forenoon that if he owes anything to any one man it is to Dr. Brodie. He said, we get a very good education at the University, but there is one thing the University does not teach and that is the large idea of citizenship. Dr. Brodie, outside of being a great scientist, was a great man, and many a teacher of science throughout Ontario to-day is a better teacher and a better man because he met Dr. Brodie in the days of his college course.

At the time of his death in 1909 I wrote an appreciation of his life for the DOMINION DENTAL JOURNAL, and what surprised me was this, that while I received letters from different parts of the province and from men in widely different spheres of life thanking me for writing that, and while different scientific papers published the appreciation of his life and work, and while even the Toronto dailies, both editorially and in their news items, spoke in the highest terms of Dr. Brodie, with the exception of one man in our profession, nobody wrote to me saying one word about Dr. Brodie. That man was Dr. Webster. I received a great deal of encouragement from him. I at that time asked that something should be done in the way of a memorial for Dr. Brodie. I received so little encouragement I almost gave up the fight. However, a few months ago I received a letter from Professor Thomson of the University, asking me if I was going to let it drop. I got his sympathy and the sympathy of Professor Montgomery, now Curator, and the sympathy of Dean Pakenham of the Faculty of Education, and we got the ball rolling again, and I think now we have a considerable amount of sympathy raised among our own profession, and with this idea in view I would name a committee to take this thing in hand and report progress. As a matter of courtesy I would like to put on the committee Professor Montgomery, Professor Dean Pakenham and Lecturer Thomson; along with these I would name the President, Dr. Irwin, Dr. Webster, Dr. Charles Pearson, Dr. Eaton, Dr. Secombe, Dr. Mason, Dr. Harold Clark, Dr. Clemes, Dr. Wunder and Dr. Reade.

Now, let us at this juncture not lost an opportunity as dentists to honor one of our profession who has done honor to us. Let us not lose the opportunity of honoring a student of science, because we are students of science ourselves, and a Canadian who, in the days to come, will be largely thanked for what he has done for the progress and advancement of our latent life. (Applause.)

DR. McLAUGHLIN: Mr. Chairman, I would like to second that motion made by Dr. Corrigan in his very able address, and in doing so I want to say this, that the nature of the discussion on this address this afternoon has been such as to emphasize what was said a year ago at the first session of our Convention as to the importance of the Presidential address. I think that I took occasion at that time to state that the presidential address should be the keynote of

the whole meeting, and if that is so, then I am sure of this, that this convention will be second to none that we have yet held in the City of Toronto. The President's address was of the right type, a brief review of the work accomplished, and valuable suggestions of what should be undertaken. The only thing I have to regret is that the meeting was not better prepared through a foreknowledge of the address to discuss it. However, we have had some admirable addresses taking up in detail the suggestions made by the President in his address, and I do hope in future conventions our programme committee will take into consideration the advisability of sending the President's Address to at least a number of the members of the Society whom you would like to undertake to discuss it. Then we will have it brought before the convention in perhaps a more thoughtful way, because no man can get up and say just what he would like to say on the important subjects that have been brought up in that address as well as he would have done had he had time to read it before hand and give it more mature consideration. I am glad that the meeting, small as it is this afternoon, is awakening to the importance of the President's address. It will be a stimulus, an important stimulus to the future Presidents to give a great deal of time and thought to the writing of the address that is always read at the beginning of this Convention. I want to congratulate the members who have already discussed this address, and I want to second the motion so ably made.

DR. W. WILMOTT: I think Dr. Corrigan's name ought to be on that Committee. (Applause.)

DR. GREEN: Ladies and Gentlemen, you have heard the motion so ably proposed by Dr. Corrigan and seconded by Dr. McLaughlin. I am sure we are all seized with the importance of the great work that Dr. Brodie has done, and I am sure we are all in sympathy with the resolution that is before us. With the addition of the name of Dr. Corrigan to the Committee which he has already named, and with Dr. Corrigan as convenor, is it your will that this Committee be appointed? (The motion was carried with applause.)

DR. GREEN: Is it the idea to report to this meeting before we close or at some future time?

DR. CORRIGAN: I would think it would be better to report to this meeting before it closes.

DR. WEBSTER: It is a very great question whether very much progress could be made in the time that we may have, but I believe the Committee ought to be called together during this meeting and have some idea of what ought to be done if it could possibly be managed.

DR. WILLMOTT: Would it not be possible for us to give that Committee power to act without reporting back to the Society as to what they ought to do? (This suggestion was greeted with applause.)

DR. GREEN: We take that as assent, but still as a matter of

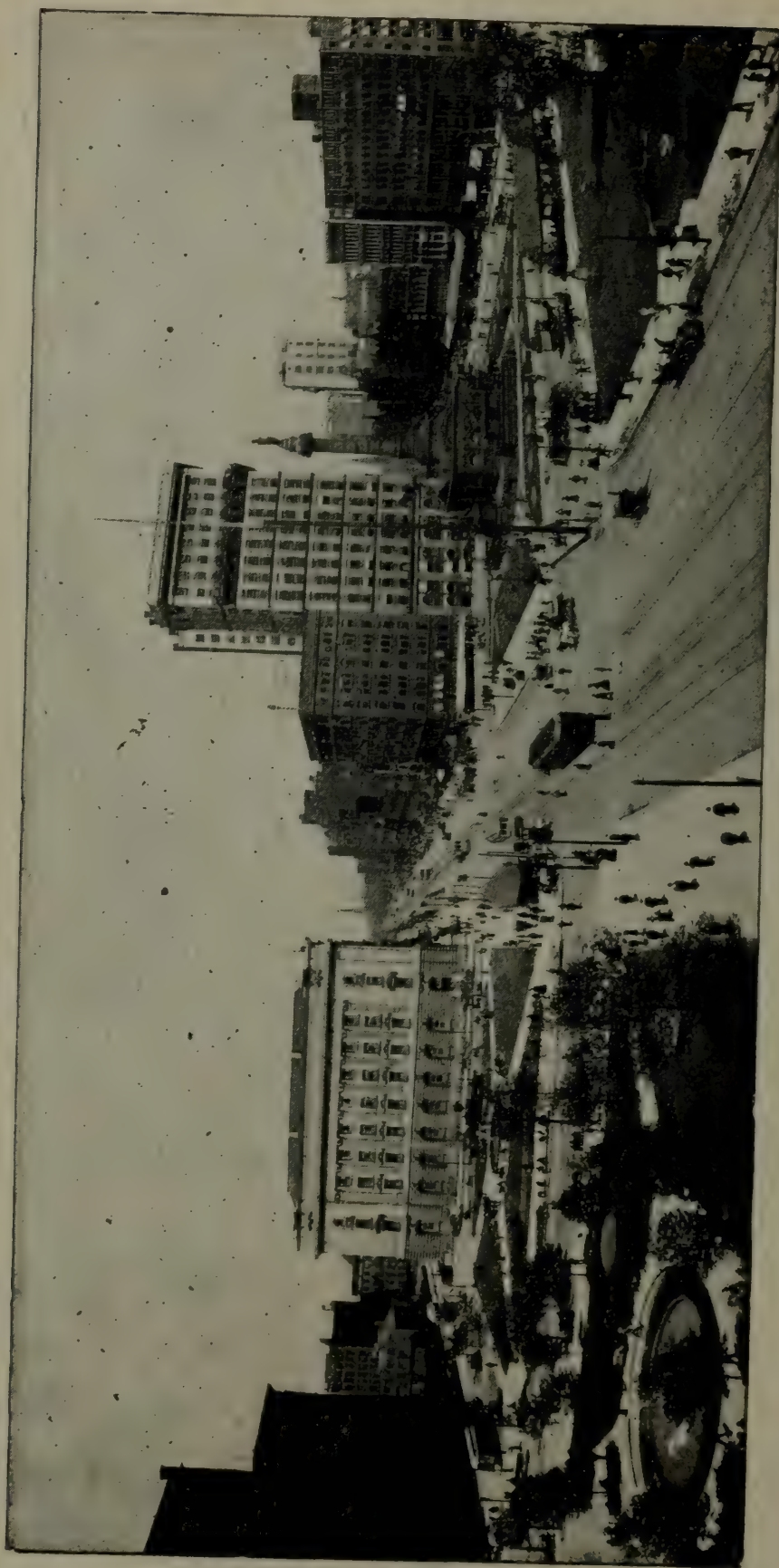
information I am sure we would be all glad if they could report some progress before the meeting closes.

DR. WILMOTT: My idea was not to tie it up for a year.

DR. GREEN: Is there any further discussion on the President's address? If not, I will ask Dr. Irwin for any remarks he may wish to make.

PRESIDENT IRWIN: Gentlemen, I have very little to say in continuing the discussion more than to thank you for the very appreciative way in which you have received this address, and the kind way in which you have expressed yourselves. I also wish to express my pleasure at the action taken in regard to the memorial for Dr. Brodie.

I might say in explanation of the point brought up by Dr. McLaughlin, that the Programme Committee were not at fault this year; they received notice to send my address to a couple of the members of the Association who were past Presidents, but neither of them is here, so that the Programme Committee is exonerated in that way.



INTERNATIONAL DENTAL ASSOCIATION

Dominion Dental Journal

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VOL. XXIII

TORONTO, JUNE 15, 1911

No. 6

MEET IN HAMILTON, 1912.

At the recent meeting of the Ontario Dental Society in Toronto the Executive Committee made some important changes in the constitution of the society. A change in the place of meeting was carried, with the consequent change in the location of many offices.

At an executive meeting of the Canadian Dental Association, held in Winnipeg in April, it was decided to ask the Ontario Dental Society if it would hold a joint meeting in Ontario, with the City of Hamilton as a possible location. The Hamilton Dental Society was communicated with to find out if the dentists of Hamilton would be willing to undertake the local work. Dr. Lester, Dr. Hoggan, representing the Hamilton dentists, and Dr. Webster, representing the Canadian Dental Association, consulted with the executive of the Ontario Dental Society. It was agreed that a combined meeting be held in the Hotel Brant at Burlington, which

is situated on Lake Ontario within a few minutes of the City of Hamilton. The Brant House has accommodation for three hundred and fifty guests, a large room for meetings and several small rooms for exhibits, a country club where all kinds of games may be played. The hotel gives everything free except the rooms and meals, which are at the reasonable rate of two dollars a day. The meeting will be held about the first of June, when the big summer hotel will have but few other guests.

There has been a feeling among some of the dentists of Ontario that the annual meeting might well be held in some city other than Toronto. Most other provincial organizations hold their meetings in various places in the province. As will be seen from the officers and committees elected by the Ontario Society, the responsibility of the meeting will fall on the dentists of Hamilton. It is expected that the officers and local executive of the Canadian Association will combine with the executive of the Ontario to form the executive of the meeting. The president of the Canadian may appoint two or three of his executive from Toronto to assist in the organization of the meeting.

Hereafter the Executive Committee of the Ontario Society will select ten members of the society, from whom the president will select five to constitute the Nomination Committee.

MONTREAL DENTAL CLUB.

The regular monthly meeting of the Montreal Dental Club was held in the University Club on Tuesday, May 23rd.

This being the last meeting of the year, after routine business the annual reports of the President and Secretary-Treasurer were presented, showing the Club to have had a prosperous year, both as regards papers, clinics, etc., and finances.

The following officers were elected for the ensuing term:

Hon. President—Dr. F. H. Stevenson.

President—D. H. Throsby.

Vice-President—Dr. Dorhan.

Secretary-Treasurer—Dr. E. C. Hutchison.

Executive Committee—Drs. Kennedy, Stuart and W. J. Kerr.

The following most interesting table clinics were presented:

Dr. H. Throsby, on the use of silicate cements used in place of porcelain bodies as a fusing base. Some excellent specimens were

shown of Ascher's cement thus used, and almost no shrinkage present. A peculiarity was that only No. 2 color seemed to fuse perfectly. The cement is mixed in the ordinary manner and used with or without a matrix base. Gives most excellent results at about 2,250 degrees fusion point.

Dr. J. B. Morison gave a talk on orthodontia, and in the course of the paper introduced an original appliance which is described at greater length in another part of this issue.

Dr. G. Cameron presented the subject, "Normal Occlusion," giving full explanation of his ideas with the assistance of various models.

Altogether this meeting proved to be one of the best of the season just closed.

AMENDMENTS TO THE SCHOOLS ACTS, ONTARIO.

In the past a teacher could collect salary for illness only upon the certificate of a physician; now a dentist can give such a certificate. Below are the amended sections:—

56 (1) Subsection 2 of section 49 of The High Schools Act is amended by striking out all the words therein after the word "physician" at the end of the fourth line, and inserting in lieu thereof the words, "or, in a case of acute inflammatory condition of the teeth or gums, by a licentiate of dental surgery, but the period of four weeks may in any case of sickness be allowed, and extended, at the pleasure of the Board without a certificate."

(2) Subsection 4 of section 85 of The Public Schools Acts is amended by striking out all the words therein after the word "physician" in the fourth and fifth lines and inserting in lieu thereof the words, "or, in case of acute inflammatory condition of the teeth or gums, by a licentiate of dental surgery, but the period of four weeks may, in any case of sickness, be allowed and extended at the pleasure of the Board without a certificate."

Editorial Notes

Dr. E. W. Sisson, of Bowmanville, has taken over the practice of Dr. Johnston, of Whitby.

Mr. Ray McGibbon, Fredericton, N.B., graduated from Baltimore College of Dental Surgery, June 1, 1911.

Joseph Schiller, of Toronto, was fined twenty-five dollars and costs for practising dentistry without a license.

Dr. B. F. Nicolls has moved from the Peterkin Bldg. to the Traders' Bank Bldg., Bloor & Yonge Streets, Toronto.

The members of the Buffalo Dental Society, and the members of the Toronto Dental Society will hold a picnic at Niagara-on-the-Lake, on June 25th, 1911.

Dr. J. B. Johnstone, of Whitby, has sold his practice to Dr. Sisson, of Bowmanville, and has bought the practice of Dr. H. G. Robb, Niagara Falls, Ont.

Dr. J. J. Wisser, Oakville, who has recently been on trial for criminal offence, has been pronounced hopelessly insane by Drs. Bruce Smith and Arthur Jukes Johnston.

At the last meeting of the Household Economic Association, Toronto, Mrs. Huestis recommended, in view of the finding of the dental examination of school children, that as new schools are built, a room be provided in each for dental and medical work, and for the nurse.

A BASEBALL CHALLENGE.

The Dentists in the vicinity of Bloor and Yonge Sts., Toronto, have challenged the Dentists of the vicinity of College and Yonge Sts. to play a game of baseball at Centre Island, July 7th, at 3 p.m. The challenge was accepted on condition that no ringers be employed.

At a recent meeting of the Mothers' Study Club, Toronto, the following resolution was passed:—"Whereas, investigation has revealed that the teeth of school children are in a most deplorable condition of neglect and decay; and whereas the preservation of the teeth is essential to good health; therefore be it resolved that the Mothers' Study Club call the Board of Education to provide free dental treatment, as well as free dental inspection, to all school children at the earliest possible date."

Many of the Canadian newspapers are at the present time printing the memorable speech by Dr. George W. Beers, delivered at a dental banquet at Syracuse, N.Y., 1888, both for and against reciprocity. It is gratifying to the dental profession to have the utterances of one of its members used as argument twenty-three years after their deliverance. The Editorial pages of the Dominion Dental Journal contain many brilliant thoughts from the pen of its distinguished founder. Thoughts and expressions which will be found apropos in professional life for decades to come.

FOR RENT.

A new flat just finished, Corner Queen and Brock Ave. The best situation in Toronto for a dentist. Apply to C. Ross, 1356 Queen St. W., Toronto, Ont.

Proceedings of Dental Societies

RESULTS OF DENTAL EXAMINATIONS AT M'GILL UNIVERSITY, MONTREAL, QUEBEC.

In the final year of the Dental department of the Medical Faculty of McGill University the results of the sessional examinations in the third and final years just announced, Messrs. Aronson, Glickman and Cunningham have qualified for the degree of D.D.S.

The following in addition have passed satisfactory examinations in operative dentistry, pathology, prosthetic dentistry, Metallurgy, crown and bridge work, orthodontia, dental surgery and dental materia medica.

A. M. Aronson, Montreal, Quebec.

A. Glickman, Montreal, Quebec.

R. B. Cunningham, M.D., Montreal, Que.

Honors—Orthodontia—1, A. Glickman; 2, A. M. Aronson. Pathology—1, A. Glickman. Dental Surgery—1, A. Glickman. Metallurgy—1, A. Glickman, 2, A. M. Aronson; 3, R. Cunningham.

THIRD YEAR.

Crown and bridge work, orthodontia, operative dentistry, pharmacology, pathology, dental surgery, prosthetic dentistry, metallurgy, and bacteriology; Boyce, W. E.; Lightstone, B.; McKenty, A. J., M. D.; Strang, A. McD.

Honors.

Crown and bridge work—1, Boyce, W. E.; 2, McKenty, A. J., M. D.; 3, Strang, A. McD. Orthodontia—1, McKenty, A. J., M. D.; 2, Lightstone, B.; 3, Strang, A. McD.

Prosthetic Dentistry—1, Boyce, W. E., and McKenty, A. J., M. D.; 2, Strang, A. McD.; 3, Lightstone, B.

Metallurgy—1, Strang, A., McD.; 2, McKenty, A. J., M. D.; 3, Boyce, W. E.; 4, Lightstone, B.

Dentists in attendance at the Dental Society of Western Canada, held in Winnipeg, April 1911.

Drs. A. S. Bannerman, Winnipeg; W. F. Monkman, Vegreville, Alta; S. W. D. Frith, Calgary; W. B. Daynard, Carman; H. E. Agar, Watrous; R. A. Harvie, Watrous; G. H. Bray, Morden; A. Raleigh, Winnipeg; C. W. Sutherland, Saskatoon; George L.

Frizell, Minnedosa; A. B. Bailey, Dauphin; L. B. Curry, Winnipeg; C. A. McBride, Winnipeg; H. R. Tweed, Winnipeg; L. S. MacDougall, Winnipeg; J. M. Rogers, Boissevain; C. J. F. Jackson, Winnipeg; D. M. Mitchell, Fort William; A. J. Clark, Weyburn, Sask.; J. M. Benson, Winnipeg; A. Fitzpatrick, Brandon; R. C. McGillivray, Portage La Prairie; A. Ross, N. Battleford; C. E. Kennedy, Winnipeg; J. J. Maloney, Winnipeg; L. R. Duff, Portage La Prairie; B. H. Weagant, Portage La Prairie; J. R. Taylor, Winnipeg; Anna M. Munro, Davidson; A. E. Webster, Toronto; D. Garnet Leckie, Winnipeg; G. F. Bush, Winnipeg; A. P. McInnis, Winnipeg; E. A. Spencer, Brandon; A. W. Callum, Calgary; F. W. Fell, Winnipeg; C. B. Johnson, Winnipeg; Chas. H. Moore, Winnipeg; W. Howard Geddes, Winnipeg; C. R. Little, Carberry, Man.; W. W. Irwin, Moose Jaw; E. Fitzpatrick, Winnipeg; A. L. Johnson, Hartney; C. P. Banning, Winnipeg; H. C. Croll, Souris; D. Norman Ross, Winnipeg; H. F. Christie, Winnipeg; Manley Bowles, Winnipeg; W. H. Reid, Winnipeg; D. A. Anderson, Winnipeg; A. J. Courtice, Winnipeg; H. C. Harwood, Moose Jaw; J. F. Taylor, Jr., Winnipeg; A. E. Proctor, Winnipeg; G. L. Clint, Winnipeg; S. B. Graham, Winnipeg; E. M. Doyle, Calgary; W. T. Hackett, Winnipeg; S. F. Bowen, Winnipeg; R. C. Bain, Grenfell; James A. O'Neill, Fort William; R. C. Campbell, Winnipeg; Dr. Cümmer, Toronto; A. H. Weagant, Winnipeg; G. C. Mathison, Winnipeg; W. D. Cowan, Regina; G. S. Cameron, Swift Current; W. H. McLaren, Okotoks; L. R. Armstrong, Indian Head; H. J. MacLaurin, Winnipeg; G. F. Brebber, Winnipeg; A. F. Dyer, Indian Head; F. S. Hamilton, Winnipeg; J. H. Riggle, Outlook Sask.; A. W. Myles, Treherne, Man.; A. S. McLachlan, Carman, Man.; J. P. Brown, Oxbow, Sask.; J. G. Manning, Regina; W. M. McNally, Winnipeg; Dr. Hartzell, Minneapolis; C. M. Walsh, Winnipeg; W. W. Wright, Winnipeg; M. H. Garvin, Winnipeg;

J. E. Ross, Winnipeg; A. E. Clint, Winnipeg; S. R. Cole, Winnipeg; J. H. Greenfield, Winnipeg; G. H. MacDonald, Neepawa; J. G. Snidal, Winnipeg; G. A. McDonald, Yorkton; A. E. St. John, Winni-

peg; E. Day Washington, Wolseley; P. W. Winthrope, Saskatoon; Y. Yuemberger; S. F. Laytob, J. G. Morrison, Virden; D. P. Stratton, Melita.

RESULTS OF EXAMINATIONS IN THE FIRST, SECOND AND THIRD YEARS, ROYAL COLLEGE OF DENTAL SURGEONS, OF ONTARIO.

THIRD YEAR.

J. T. Adams, H. S. Allen, P. G. Atkinson, C. O. Bond, T. Cowling, F. R. Davis, R. S. Decker, C. A. Detlor, B.A., C. J. Levine, A. A. Dickson, N.K. Douglas, R. V. Hall, F. Hinds, J. H. Hockin, A. R. Hynes, F. H. Jones, R. D. Kerr, F. W. Landymore, G. A. Liscumb, W. G. Manning, H. W. Mitchell, J. H. W. Moore, W. Morley, V. H. Maccauley, S. C. McCaughy, E. C. McDonald, R. G. MacGregor, M. A. McIntyre, D. K. McIntosh, R. J. Penhal, F. N. Regan, T. H. Renton, F. E. Sandercock, L. E. V. Tanner, A. S. Thomson, R. D. Thornton, M. G. Vair, D. J. Weadick.*

*Prevented by illness from writing on all subjects. Passed those written on.

SECOND YEAR.

J. B. Aiken, J. C. Allan, G. F. Allison, F. H. Bancroft, D. L. Brown, G. V. Connolly, P. E. Crysler, J. A. Dean, C. A. Detlor, J. M. Dixon, W. J. McL. Dolson, J. R. Doyle, W. J. Fuller, L. S. Goodwin, G. W. Harris, W. T. Haynes, W. E. Hughes, K. M. Johnson, E. J. Lehman, W. B. Leath-
erdale, J. H. Lumsden, E. D. Madden, C. R. Minns, A. D. MacPherson, D. A. McCarten,

W. J. McEwen, E. F. McGregor, D. A. McKay, W. H. McLaughlin, D. R. McLean, M. R. Parkin, J. V. Pinard, M. Pivnick, C. Purdon, N. Regan, J. W. Reynolds, G. I. Robertson, L. M. Ryerse, H. M. Schweitzer, R. C. H. Staples, W. D. Stevens, M. C. Tindale, W. G. Trelford, C. E. Vandervoort, G. A. Wilcox, J. H. Wiltse, N. H. Winn, S. H. Zinn. Also completed second year: H. Hockin. Prevented by illness from writing: R. Beare.

FIRST YEAR.

I. H. Ante, H. F. B. Black, L. F. Boyle, H. K. Box, J. S. Bricker, H. J. Clarke, G. Coveyduc, J. H. Duff, W. S. Elliott, H. Farrell, C. M. Fletcher, F. C. Fraser, G. Fraser, E. W. Fuller, B. R. Gardiner, J. S. Girvin, C. E. Higley, A. N. Hill, T. G. Honnlingshead, S. S. Ianson, J. I. Kelley, L. D. Leonard, R. V. McLaughlin, E. Norman, C. R. O'Brien, C. LaVerne Pattison, E. A. Ross, S. Rutledge, H. V. Schwalm, J. K. Scott, J. F. Seffen, A. V. Sinclair, A. J. Sipes, C. Soules, F. S. Spieres, H. A. Stewart, J. A. Stewart, D. J. Sutherland, H. J. Swift, L. H. Thornton, P. J. Watson, G. Zimmerman. Also completed second year: J. F. McGregor, F. N. Regan, J. V. Pinard, S. H. Zinn, C. A. Detlor.

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THE BUSINESS SIDE OF PROFESSIONAL LIFE.

By C. N. Johnson, M.A., L.D.S., D.D.S.,
Chicago, Ill.

The next step is to begin saving. And here is the stumbling block which trips many a dentist up and leaves him sprawling and floundering helplessly through life. To be able to earn money is so much easier for most men than to be able to save it, and with professional men especially, there seems to be an utter lack of business acumen when it comes to husbanding their financial resources.

This brings up the subject of investments for professional men, and it is upon this phase of the subject that I wish particularly to invite your attention. If there is any crime in all the category of business depravity more despicable than another it is the way in which professional men have been imposed upon by the mining shark, the wildcat stock broker, or the get-rich-quick promoter of every kind. It is on a par with stealing from widows and orphans, because frequently the widows and orphans of professional men have been made to suffer as a consequence. The professional man has long been known as an "easy mark" for these gentry. I know of one instance where a dentist was offered

a one-third interest in a broker's firm without furnishing a dollar merely for the influence he could use to induce his fellow dentists to patronize the place.

It is simply appalling when we consider the amount of hard-earned money which professional men have put in to worthless mining stock, Mexican plantations, stock speculations, and all sorts of worthless schemes, calculated only to catch the unwary. The ingenuity of some of these promoters is really wonderful, and the very next man who approaches you with an alluring proposition to make money will have some new manner of presenting it which will make it appear that you cannot possibly lose. There is not a trick in horse trading which can equal the shrewdness displayed by these men. They frequently come apparently recommended by some of the very best citizens, and in fact some of the very best citizens are often taken in by them. If I can induce one man among all my hearers to turn the cold shoulder on every kind and species of promoter I shall feel that my trip to St. Paul has been well worth while. I want to live to see the day when the members of my profession shall keep for themselves and their families the results of

their hard earnings instead of dissipating so much of them in the support of rogues and swindlers as well as of well-meaning visionaries.

Having said this much in disapproval of certain kinds of investments, it might seem proper for me to consider briefly what I deem to be a proper form of investment for professional men. I am not here to advise, but merely suggest, and my first suggestion is that the professional man should put the next money he earns after his debts are paid into a home. Ever since I have been old enough to discuss this question with men I have heard the same old story that it is cheaper to rent than it is to own your own home, but I have studied this matter somewhat carefully as it relates to professional men, and I am convinced that it is a very great fallacy to suppose that the average professional man can invest his money so that he can make it more profitable than it will be in a home. Even if it were possible for him by shrewd investments to turn over more money than he could by owning a home there is still the civic aspect of the case which no good citizen should ignore. A man who owns his own home is anchored in the community in a different sense from the renter, and while the one may be as worthy a member of society as the other, yet the owner sustains a more permanent and responsible relationship to the community than does the renter, and is more vitally interested in the welfare of the commonwealth. To own one's home gives one a sense of security which can be obtained in no other way, and so far as professional men are concerned it is confidently believed that it is the very best investment that can be made. It often proves the one sole substantial thing left of all a lifetime's earnings, and many a man in his old age has had this as a solace when all else had slipped from his grasp. In studying the financial status of dentists I have been impressed with the fact that the majority of those who have gained a competence have been those who have earned homes, and usually if they did not own homes they did not own anything.

But after the home is paid for then the dentist should aim to invest his earnings so that they will bring him returns in the

way of interest. In other words he ought to make his money earn money. In seeking investments of this kind it is well for the dentist to consult with some level-headed, honest business man who has given much study to this question. If the dentist can be assured of the absolute honesty of his banker he is the logical and proper person to consult. It is his business to study investments. If the banker requires information regarding dental matters he goes to his dentist, and it ought to be just as logical for the dentist when he wishes information regarding money matters to consult his banker.

In a general way it may be said that a good class of investments for the professional man can be found in mortgages, bonds, or in long established dividend paying stocks. Please remember that when I speak of investing in stocks I do not refer to dealing in margins. I mean buying the stock outright, placing the certificates in the safe, and going on with your professional pursuit. The man who deals in margins cannot practice dentistry properly, and usually he cannot sleep nights comfortably. Do not try to make 7 per cent. on your money unless you live far away from the great financial centers and where money is scarce. The greed for high interest leads inevitably into unsafe security. Be content with established and legitimate rates of interest, and you may rest assured that in a few years after you have turned tide so that interest flows toward you instead of away from you a legitimate interest will make you independent.

In conclusion, I bring to you the message borne in on me by years of observation that it is the natural birthright of the professional man who conscientiously does his duty by humanity to be blessed in his declining days by sufficient of this world's goods to gratify all the cultural tastes which should go with a well-rounded professional life, and that I believe this desideratum possible in every instance where a man early enough will give intelligent and consecutive consideration to the problem. I want to see my profession come into its rightful heritage and reap some of the benefits which should accrue to men who labor so faithfully in the interests of the human race.—The Dental Review.

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Original Communications

SOME NEGLECTED FEATURES IN DENTAL PROSTHESIS.

W. E. CUMMER, D.D.S., L.D.S., TORONTO.

Read before the Dental Society of Western Canada, at Winnipeg, April, 1911.

Notwithstanding the immense impetus manifested by modern dentistry along the lines of the prophylactic and operative branches, requiring for their successful practice enormous diversity of knowledge and skill, and, naturally and rightly so, usurping, in the minds of most practitioners their interest, the prosthetic division, the fact still remains that teeth are being removed daily, which get past the skill of the profession, and that their late unfortunate owners present themselves to us every day for their replacement. And also, in view of the present-day knowledge of the subject, it is borne home to the minds of those more particularly interested in the prosthetic field, that their replacement, correct from a mechanical and artistic point of view, requires an amount of judgment, experience, knowledge and skill which constitutes quite as great a tax upon the prosthetist as would any of the operations involved in the prophylactic or operative division of dentistry. And it is with an earnest desire of being of assistance, more particularly to those whose minds are engrossed with the problem of saving teeth, at the expense of the problem of replacing teeth that these few thoughts are offered.

EXAMINATION OF MOUTH.

At the very outset, in many cases, after the patient is seated in the chair, and the patient's lips are separated, is the complex character of the work made manifest. For as in any other mechanical structure the elements must find a base upon which to rest, and we must decide whether our mechanism must rest upon the mucous membrane roots, or upon the mucous membrane and roots in combination the one with the other. This

settled, in the mind of the prosthetist, the problem of retaining the appliances in place must be dealt with in such a manner as to secure the greatest functional efficiency without disturbance of the health of the remaining teeth or the mucous membrane or other tissues. These, coupled with the necessity of occasionally retaining loose teeth with our appliance, bringing malposed teeth into harmony with the normal movement of the mandible established by the condyle path, bringing the stress as nearly over the ridge as possible without disturbing the desired contour of the patient's features, as well as furnishing ourselves with information necessary to answer pertinent questions from the patient relating to time necessary, fee, etc., present complexities sometimes so great as to render their solution impossible until models are in their sane working relation upon the anatomical articulator as the previously occupied in the patient's mouth.

TAKING IMPRESSION.

Having completed the examination of the case, and formed, at least, an approximate idea of the manner of the restoration, the next concern in making a prosthetic appliance (using the word in its limited sense, excluding crown and bridge work), is with the taking of the impression, involving naturally the selection of a proper tray and material, and with a very definite end in view, namely, the securing of an accurate impression, under ordinary working pressure, without undue distortion of any tissue of lesser density which may happen to be present. The necessity for this is evident, for if the impression of an average mouth be taken in a material exerting little or no pressure, as soft plaster of paris, the model represents the softer tissues in a state of non-condensation, and the denture made from that impression receives little or no support from these softer areas, and rests upon the hard areas, practically bridging the soft areas in proportion to the areas and location.

In edentulous mouths this is accomplished, in the writer's mind, in the large majority of cases, by the use of impression compound, mounted on a suitable tray, bent in such a manner as to leave about one-quarter inch for the material, which is inserted in the mouth, pressed home, and then removed before it has quite reached a rigid state, and, while in that semi-rigid condition, is slightly enlarged with the thumb and first finger, chilled, and about a dessert-spoonful of plaster, barely viscid enough to drop off the end of the spatula, is properly distributed on the surface of this (with a greater depth in the ridges) and quickly reinserted, and held there under about 15 pounds pressure, until plaster has set. This in full upper cases, where the density of the tissues covered by the denture is uniform, will give an accurate model of the tissues under pressure, and is all that is necessary to secure firm retention of denture. Cases in which the density of the tissues is

not uniform, and which constitute the larger proportion, require further attention as the case progresses, later spoken of under the head of "Compensation of Models."

In the experience of the writer, the above technique gives most accurate results in the large majority of cases, in which the mucous membrane covering of the bony structure of the mouth, is more or less compressible. Occasionally, however, two extremes of density of this tissue present, almost always in the upper mouth, requiring slight modification of the technique of the impression. Of these two extremes in density of tissue in the upper mouth, perhaps the most commonly met with is that condition in which usually the anterior half of the ridge, occasionally other portions of the ridge, is so soft and pliable that it can be readily swung back and forth within radius of its own length, usually due to the wearing of a full upper denture antagonizing on one small part of its masticating surface only, causing by extreme pressure undue absorption of the bony reinforcement underneath. In taking an impression of an upper mouth of this kind, in which surgery is not indicated, the tray is selected and bent to fit approximately and the impression taken in soft compound and removed. Under this impression the very pliable area becomes very much distorted, often doubling over itself. In order to correct this the impression, in addition to the slight enlargement given with the thumb and finger, is cut away extensively in the location of the pliable area, sufficient to allow it to remain in its vertical position when the compound impression is replaced. This when covered with the fluid mixture of plaster, exerts a uniform pressure from all directions on the extremely pliable area, according to Pascal's principle (in which pressure exerted anywhere upon a mass of fluid is transmitted, undiminished in all directions), thus condensing it, and, on the subsequent model, affording a great deal of support for the denture at that point, and in the majority of cases giving good adaptation. The only variety of this class of case in which the writer would adopt a different procedure in securing the impression would be a case where the facilities afforded for adhesion by the firm portion of the vault were so poor, due perhaps to circumstances as high muscular attachment, thin, watery saliva, hard, dense mucous membrane, remaining large extent of soft area or other conditions where the adhesion is so poor as to insufficiently offset the natural tending for the condensed pliable tissue to expand, thus throwing down the denture. In a case of that nature, in the mind of the writer, soft plaster is indicated.

The other extreme in the choice and handling of material for the taking of an impression, is found in the dealing of that class of case in which the mucous membrane is tightly stretched over the bony substructure, often practically without elasticity, forming a vault which is hard, dense, and without movement under pressure of finger. This, coupled with a thin, watery saliva, makes adhesion

very difficult, and in the mind of the writer, the best results are obtained by the use of a compound impression, taken on an accurate tray, removed, and the maxillary surface of the compound impression treated by waving over a Bunsen flame a few times, softening the surface, for perhaps the depth of one-sixteenth to one-eighth of an inch, leaving the subjacent material cool and rigid, quickly returning to the mouth in this state, and holding it, under considerable pressure, until rigid. This has been found to give excellent results in these cases.

In taking an impression of an upper or lower mouth, in which part of the number of the natural teeth are present, the writer wishes to add testimony to the efficiency and accuracy of Plaster of Paris. With the Angle Orthodontia Impression Trays, oiled, and the use of a quick setting plaster, as French's, and the removal of the tray, and subsequently of the impression, shortly after crystallization has taken place, and before the plaster reaches its normal "set," a rapid and fairly comfortable impression may be taken, amply rewarding the operator for his pains in its accuracy. In many cases where the natural teeth are not isolated, the impression may be taken in compound first, the depression made by the teeth enlarged and shaped to avoid undercut, and retaken in plaster, as in case of edentular mouth, securing the additional advantage of a model under pressure, although in the majority of cases for partial restorations the requirements for a model under pressure and its superior adhesion are not as pressing as in the case of the full denture, and in the case of the straight plaster impression, may be corrected by means of compensation mentioned later.

THE PLASTER MODEL.

The examination having been made, which, with the choice of the shade and form of the teeth (allowing opportunity for verification at subsequent sittings), the impressions are made and the patient dismissed. And it is at this point that the advantages gained by many a carefully made impression are lost through inaccuracies in the technique of the next step, namely, the formation of the plaster model. The most common inaccuracies are caused by the tendency of plaster of paris to expand and buckle while setting, and its compressibility which may be largely avoided by the observance of the following precautions:

1. The use of a rapid drying separating medium.
2. The immediate pouring of the plaster model as soon as the separating medium may be applied and dried.
3. The proper manipulation of the plaster of paris to control expansion.
4. In use of a model for vulcanite the non-use of agents hastening the "set."

It has become well known in the profession, that the predominating tendency, in plaster of paris, is its transition from a

mechanical mixture of the dehydrated calcium sulphate and water to the chemical union of the same, is toward an expansive movement. This is controllable to a large extent, but liability to distortion in the case of a plaster model being formed upon a plaster impression is very greatly reduced by the pouring of the model as soon as possible after the impression is removed from the mouth, thus if any expansion may take place the movement in the plaster of the impression and the model is nearly simultaneous, thus avoiding distortion. The only time consuming element between the removal of the impression from the mouth and the application of the plaster batter to the impression lies in the application of the separating medium, and in this connection the writer cannot refrain from giving a formula which has given a great deal of satisfaction in the Prosthetic Department in the Royal College of Dental Surgeons.

Separating Medium or Water Shellac Varnish.

Best Gum Shellac	2 ozs.
Borax	1 oz.
Water	2-3 pt.

or about 14 fluid ozs.

Dissolve the borax in the water; bring to a boil, and add slowly to the gum shellac, previously placed in the bottom of a wide-mouthed pint bottle. Stir. Keep well corked.

This medium may be applied to a plaster impression which is barely "set," dried by means of compressed air, and in the time of 15 seconds the plaster for the model may be applied.

With respect to the proper manipulation of the plaster, the literature of the profession furnishes instances of conclusive experiments carried on which show that plaster of paris, batter or unset plaster, when subject to any agitation lasting over ten seconds, a rapid and cumulative expansion takes place, beginning about the time of the evolution of heat (usually from 4 to 10 minutes, depending on the plaster), the maximum expansion being over in the next ten minutes, and slow contraction lasting over 24 hours. The lesson is to so bring into contact the plaster and water as to require not more than ten seconds agitation to secure homogeneity. This may be secured by sifting plaster off the spatula into the water previously placed in the bowl until sufficient has been added, homogeneity being obtained by a rapid sidewise cutting movement of the blade in the mix, while the bowl is given a slow rotatory motion with the left hand in duration of time not exceeding 10 seconds. In fact, in some of the more readily assimilable plasters, this latter movement is unnecessary, homogeneity being possible by the simple moving in and out of the walls of the flexible rubber plaster bowl.

The point mentioned of sufficient depth of plaster over the highest point of the impression is an important one. At least $\frac{5}{8}$ in. of plaster should be built here to stiffen the mass, and thus prevent the buckling upward.

VARYING DENSITIES OF TISSUES.

An accurate model of the tissues under pressure having been made, the next logical step in the restoration takes place in the presence of the patient at the second sitting, and is rendered necessary by the different densities of tissue usually found in the vaults of most edentulous mouths. With the upper model on the bracket cable, and a lead pencil within easy reach, a careful, tactile examination of the vault portion is made with the smooth ball end of a cone-socket instrument (not including the ridge) for marked differences in the density of tissue. Beginning a little to one side of the median line, and exerting barely enough pressure on the instrument to carry through the fingers to the brain, the sensation of different densities of tissue, about an ounce or two, the instrument is drawn across at right angles from the ridge to the median line, working backward about a sixteenth of an inch each time, hatching the entire half of the vault portion. In its travel presently the instrument will seem to climb a little eminence on the vault, and we stop and mark this on the model, and the instrument on the next stroke reveals the same eminence, only perhaps a trifle to the buccal or lingual, as the case may be. This is marked and the process continued, until one-half of the dense central area, almost always present, has been outlined. The same process is followed on the other half of the vault portion, drawing the instrument towards the centre, and this having been finished, a record of a well defined denser central area of various outlines is obtained. This very frequent result of such a tactile examination discloses a vault of two densities which is a common condition, more frequently, however, the examination discloses, in addition to the hard central area, two triangular shaped areas on either side of the hard central area usually merging into the soft palate of tissue less dense than the vault tissue, and very considerably less dense than the hard area. In this case there are present three densities, and in the other and unusual class of case the instrument fails to disclose any difference in any portion of the vault other than the one density.

An artificial denture made up on accurate models of either two or three density vaults without compensation would fail to be completely successful in adaptation and consequent adhesion because in the two density vault the base would bear heavily, rock in the centre depending on the amount of difference in the two densities, and in the instance of the three densities it would rock in the centre, and leak air on either side of the centre over the softer areas. Therefore, it is recommended to compensate these differences by means of a soft metal lift pinned on the model over the hard area varying in thickness from 14 to 20 guage B. & S., depending on the amount of difference in density of tissue terminating about $\frac{1}{8}$ in. ahead of the distal part of the base, and in the case of the three density vault, in addition to this the soft areas are scraped

on the model, securing closer adaptation at this point, and in the case of the one density vault no change or addition (under ordinary circumstances of fairly elastic mucous membrane covering and fairly thick saliva) is required. This process has been referred to previously in this paper as compensation of the vault portion of models, and with respect to the ridge portion of the model in the experience of the writer usually no compensation is necessary, the impression under pressure taking care of that.

Compensation of differences in vault tissue upon a model intended to be used as a pattern for a cast for swaging is carried out to best advantage in a very similar manner. For a 2 density vault the left is outlined on the metal cast, terminating $\frac{1}{8}$ in. ahead of distal margin base, the soft metal lift made and waxed upon the cast and the swaged baseplate reswaged upon it. For a three density vault the soft areas are scraped on the plaster pattern, and the lift fitted on the metal cast and the base plate reswaged as before.

OUTLINE OF DENTURE.

The compensation of the model having been disposed of, which, in the writer's custom, is the first step taken in the second sitting, the next logical step to be taken is the determination of outline of the denture. With both plaster models and a lead pencil near at hand this may be quickly done by raising and slightly drawing out the upper lip, noting the attachments of the cheeks, lip and frenu, etc., and the division between the hard and soft palates on the lower by asking the patient to raise the tongue and noting the position of the attachments and drawing out the lower lip and cheeks and noting their attachments, tracing each outline on the model as observed. In the case of a swaged metal base the outline is readily transferred to the cast, the swaged base trimmed to it, and verified along with the compensation at a subsequent sitting; and in the vulcanite or cast metal base may be verified while the patient is present by quickly adapting a sheet or hard wax on the compensated model, through which the lead pencil mark will show, trimming to the mark, stiffening with some sheet metal in the upper, or a wire in the lower, and returning to the mouth before proceeding with the next step in taking the bite thus verifying both the compensation and the outline. Specially prepared base plates, such as Detroit, the S. S. White, or impression compound rolled thus may be, of course, used in a similar manner

TRIAL PLATES.

Many operators prefer, in constructing full dentures of vulcanite, especially those built on anatomical lines, at this point, after verifying the compensation and outline to proceed and make the base of vulcanite, using it as a trial plate in proceeding through the various steps of "taking the bite," subsequently revulcanizing the

teeth upon it. While this requires an extra sitting, and little additional work, especially little if it is vulcanized in a tinfoil matrix, the operator is more than repaid by the additional stability of the trial plates in taking the bite, and the greatly lessened chances of failure due to distortion of the trial plate, and the additional advantage of a neater and denser vulcanite base.

With regard to the choice of base, the writer hopes that the great possibilities connected with the casting of metals, especially aluminum, and the improved and simplified methods in the shaping of sheet metal bases to the mouth will result in time in the discontinuance of vulcanite as a base for artificial dentures, reserving its use for a function which it fills satisfactorily, namely, as a medium for attachment between the metallic base and the artificial porcelain teeth.

The maxillary part of the trial plates having been completed, the next item in the second sitting followed by the writer in practice is the building down of the upper trial plate in hard wax to a point a millimetre or two past the upper lip in repose, at which point the tips of the upper central incisors will coincide, and coincident with an imaginary plane spoken of as the occlusal plane. This so-called occlusal plane to which the upper trial plate is trimmed is an imaginary plane, which represents the average position of the articulating surfaces of the teeth touching the distobuccal cusps of the lower second molars and tips of the lower central incisor in a normal, natural denture, forms a plane to which the trial plates should be trimmed, and from which all angles and curves in articulating teeth "anatomically," the name by which this system has become known, are calculated.

ARTICULATING TEETH.

The system of articulating teeth anatomically (or in other words, following as closely on the normal natural mechanism as is possible in artificial teeth) has been defined as a system in which the movement of the mandible (which differs in different individuals and which depend largely on the slope of the path of the condyle during function) are accurately reproduced on an articulator, and, upon models correctly located upon that articulator, teeth are subsequently fitted and ground in such a manner as to place equal pressure upon all parts of the dentures in all positions of the mandible.

Dr. Clapp in his valuable book on "Mechanical Side of Anatomical Articulation," says that "Artificial dentures are anatomically articulated when they exhibit the characters of articulation common to the best natural denture." He goes on to say that these are very rare, having only found three out of 1,500 skulls in Museum of Natural History in New York, and that they are characterized by three great facts, as follows:

1. When the mandible is thrown to one side and brought into

contact with the upper teeth, the lower teeth are in contact with the uppers at three widely separated points. On the side engaged in crushing the food, the lower teeth, from central to third molar, are in contact with the opposing uppers. The lower third molar on the opposite side is in contact with the upper second molar. In artificial dentures this form of contact prevents dislodgment of either denture and permits the exertion of an amount of force otherwise impossible. It has been erroneously styled "three point contact," but there is contact at more than three points.

2. When the teeth are in lateral articulation, the buccal cusps of the lowers are laterally in line with the buccal cusps of the uppers. The lingual cusps of the lowers are in line with the lingual cusps of the uppers. The sulci and fossae of the opposed occlusal surfaces form a space known as the rectangular groove. In this groove the food is compressed.

3. The food in the rectangular groove is finally crushed by the mandible sliding toward the median line. The buccal cusps of either set, on the side engaged in crushing, slide through the spaces between the teeth of the other set, or through buccal grooves. This relation of cusps to grooves, with the aid of the articulating molars on the opposite side of the mouth, prevents the dislodgment of dentures made on this principle.

The lingual cusps move through interdental spaces or lingual grooves in a similar manner.

It may readily be seen that artificial dentures exhibiting the properties of these natural dentures fulfil the functions that rare mechanism, a normal natural denture, to an extent limited only by the compressibility of the mucous membrane upon which they rest, which Dr. Black tells us, will only bear 1-6 to 1-10 pressure under denture as the normal teeth, and just what a satisfaction it is to have conferred upon a patient.

This boon of proper mastication and insalivation is experienced by the operator upon the completion of a case of this nature, more especially after replacing denture built upon the old lines of the up and down scissor-like moving articulation, without reference to the anatomical peculiarities of the patient and therefore without triturating and grinding facilities.

In the study of this system a few words bearing upon the theory which lies back of "anatomical articulation" are necessary. Firstly it must be remembered, as has already been stated, that the condyle follows a path varying from 0 to about 55 from the occlusal plane, usually the same on both sides of an individual, sometimes different in each side in an individual. The relation which the "occlusal plane" bears with other anatomical features concerning us in this work are as follows:

1. Touches a point previously occupied by the incisal edges of the lower central incisor and disto-buccal cusps of lower second molars.

2. Cuts facial line at 75.

3. Is parallel to line drawn from opening of ear to root of nose.

4. If produced usually touches tip of ear.

These last two properties of the occlusal plane are of greatest service in trimming the trial plate to coincide with it.

Continuing a little farther along the same line, the condyle path, in addition to having an inclination from 0 to 55 from the occlusal plane, possesses another very important feature, *i.e.*, that in a normal denture there is a very definite relation between the inclination of the condyle path, and the curve of Spee, or compensating curve, a definition of which is as follows:—

The position of the articulating surfaces of the teeth in normal articulation assume the form of a curve when viewed from the lateral aspect, called the compensating curve or curve of Spee. A curve produced labio-lingually, touching the cusps of the teeth, will be found to coincide with the curve, it may be said that the articulating surfaces of the teeth are arranged in the form of a concave and convex spheres, the uppers convex, the lowers concave, the amount of curvature varying with the amount of inclination of the condyle path and proportional to it, *i.e.*, the steeper the inclination, the greater convexity, or shorter radius, of the curve.

The relation between this tooth curve or compensating curve, or curve of Spee, or subsidiary curve, as Dr. Gysi has called it, and the inclination of the condyle path will explain many failures in prosthesis made up on non-anatomical articulation or even upon anatomical articulation, where certain necessary steps are not observed. In order to avoid failures of this nature, and to produce results corresponding with the normal natural denture, three essentials are necessary:—

- (a) The use of an articulator with moveable joint slides, anatomically placed, imitating the different inclinations of the condyle path.
- (b) A means of locating the models of the ridges in the same relation to the joints of the articulator as the natural ridges in the mouth bear to the temporo-maxillary joint.
- (c) A simple means of registry of the condyle path.

Each of these is within the reach of every dentist and student, and their successful manipulation is also within the reach of every dentist and every student who has absorbed the foundation principles of dental prosthesis. With regard to the articulator, the writer knows from experience that surprising results may be obtained by any dentist in the mouths of his patients, and by freshmen students upon dummy work, by the use of these foregoing principles, which are the composite results of Bonwell, Walker, Gritman, Snow, Prothero, and others, in the conjunction with the Snow Articulator face bow and bite gauges. Within the last few months Dr. Gysi, of the University of Zurich, Switzerland, has brought forth a series of epoch-making articles, and his articulator,

which, generally speaking, utilizes largely the same principles as set forth here, carrying them, however, to much greater refinement, and utilizing measurements not taken into account in this paper, and of whose work, experience, research, and results, both in the mechanism with which he has increased the possibilities of this subject, and the learning with which he has enriched the literature, involves such a vast clinical experience, such a profound learning and versatility, coupled with mechanical ability and resourcefulness of the first order, as to place this gentleman in the very first rank of the roll of investigators in this subject, and even a brief account of whose work could not become compressed within the compass of a paper such as this.

With respect to the correct location of the models, it is absolutely necessary for the success of the work, as will be shown at a later stage in the paper. The old triangular theory of Bonwell's showing 4 inches between the condyles and 4 inches from contact point of lower incisor to condyles, has been long exploded, and individual measurements of each case is necessary. In addition to the proper distance, the proper relation of the models to the joint in the articulator, as previously existed between the ridges and the temporo-maxillary joint, is necessary. This is done with the Snow face bow in about three minutes time, and without any demands on the skill of the operator. The simple means of determining the slope of the condyle path will be referred to later in its order in the steps in taking the bite.

TRIMMING TRIAL PLATES.

To return to the thread of the discussion, namely, the shaping of the upper trial plate to a point 2 mm. past the lip in repose, and coincident with the occlusal plane, after compensation and correct outline has been secured: the maxillary portion of the upper trial plate is laid on the model and a whole sheet of hard wax is warmed and softened, and formed rapidly into a square rope, and laid upon the crest of the ridge of the maxillary portion of the upper trial plate, and quickly worked down with the thumb and finger into the approximate form which, in the judgment of the operator, will most closely approximate the contour necessary to build out the features properly and to approximate the occlusal plane. While still warm this is quickly returned to the mouth and a point about 2 mm. past lip in repose is marked upon it. It is then removed and trimmed at the anterior part, then a flat strip of metal, for instance a straight dessert knife, is laid on each side in succession and held, the operator noting if the knife corresponds to the occlusal plane. If not, the wax at the distal part of each side of the upper trial plate is either trimmed off, or fresh added on, until the knife corresponds with the occlusal plane. The trial plate is then removed, chilled, under the cold water tap, replaced on the model and rubbed on a piece of coarse sand-

paper to give it a perfectly flat surface, and moistened with vaseline. A little lump about three or four mm. high, pyramidal shape, is then attached to its furthest distal position in the median line, and, with the patient still in the chair, is laid aside, and the rim for the lower trial plate is formed in similar fashion to upper. When approximately formed both are returned to the mouth, the upper cold and hard, the lower warm and soft, the patient directed to touch the cone of wax on the distal part of the upper trial plate with the tongue, and to "close," and she is allowed to exert pressure upon the lower trial plate until, in the operator's judgment, the chin has come close enough to the nose for the preservation of the balance in the profile, and then is directed to cease the pressure. Trial plates are then removed, and it will be found that the upper trial plate has made the impression of the occlusal plane upon the lower, and with a slight amount of trimming will coincide with it. However, for safety's sake, the writer recommends that they be returned to the mouth in order to prove that uniform contact exists, a thin instrument, as a cement spatula, is inserted, and an attempt made to separate the trial plates against pressure exerted by the patient. If no movement is shown, the next step may be followed, namely, the re-establishment of the facial contour.

This is part of the system in which a conception of the values of the various contours of various types of faces is required, and even with this a great deal of experience is required. The writer usually adopts the practice of not building out the trial plates to too great an extent at first, and of inserting and removing small rolls of cotton under the lips in the necessary locations, until the proper contours are established, then noting their positions and building on in wax:—saving time and "waxing," and, in the mind of the writer, the prothetist, in making this part of the restoration, as the orthodontist in making similar restorations of the features, touches a very high level in his art, and is, in a sense, a sculptor, only working on living vital tissues rather than the cold marble.

This step having been satisfactorily disposed of, the median line is next determined and marked. In individuals with regular features, this mark is made usually midway between the angle of the mouth, and in persons of irregular features a straight edge is laid along the median line of the face and the different values of each of the features estimated, and the straight edge moved until they are divided evenly, keeping as near to the centre of the mouth as possible.

Next, the high lip line, or position of the lip in smiling, is marked later of value in choosing length of teeth, also the angle of the mouth at rest, locating the position of the distal surfaces of the cuspids and next the protrusion bite.

It may be readily seen, in the mouth of a patient, descent or inclination of the condyle path, that in a protrusive movement, a

depression takes place at the condyle of the inferior maxillo, and, in a lesser degree, at the molar region of the trial plates, directly proportionate to the inclination of the path of the condyle, resulting in a separation of the trial plates, also directly proportional to the inclination of the condyle path. Professor Christiansen, of the University of Copenhagen, made use of this principle in recording this separation and subsequently using it to reproduce the inclination on the joint slides of the articulator. His method was the insertion of small wax rolls at the distal parts of the lower trial plate, but Dr. Snow, of the University of Buffalo, has evolved a very decided improvement over this, which he calls the bite gauges, small pyramidal-shaped pieces of brass, with spurs below, which can be removed after the protrusive bite is taken, permitting the subsequent taking of the rest bite and mounting of the models on the articulator, and admitting of replacement (after the remaining steps of taking the bite are completed and the patient has left), for the setting of the condyle paths of the articulator corresponding to the condyle path of the patient.

A protrusive may be obtained from the average patient in three or four minutes, and the procedure for using the Snow bite gauges is as follows:—

With the trial plates in position, the patient is requested to open the mouth slightly and to make a protrusive movement of from $1/8$ to $1/4$ inch, when the patient can satisfactorily do this, the lower trial plate is removed, the bite gauges inserted about the second molar region, as far to the lingual as possible, the whole replaced in the mouth and the patient instructed to again make the protrusive movement. After this has been satisfactorily accomplished, the trial plate and the bite gauges are removed from the mouth, and the bite gauges from the lower trial plate, leaving their imprint for future replacement in this relation, and the face bow stem is melted in between the high lip line and lower margin of the upper trial plate, both are returned to the mouth, the patient asked to turn the tongue back to the small elevation of wax at the distal part of the upper trial plate, to ensure the "resting bite," and the Snow face bow adjusted, taking care to have the patient's head exactly in the centre, which can be done very easily by reading the graduations on the sliding rods which are fitted on the skin of the cheek immediately over the condyle, above the condyle just before clamping them. This having been accomplished, the wing joining the bite stem of the face bow with the face bow proper is tightened, the trial plates are securely fastened together by two flat staples of galvanized iron about $1/4$ inch wide, the sliding rods fitting over the condyle are loosened and the whole withdrawn, and the patient dismissed, except for the verification of shade chosen in the first sitting, if necessary. Thus incorporated in the trial plates and face bow as removed from the mouth, we have every dimension needed for the completion of the dentures without

reference to the patient, although in actual practice, this is not advisable, and in the second sitting the only additional item in the procedure between an anatomical and a non-anatomical are the slight extra care in getting the trial plates to conform to the occlusal plane, the extra bite (protrusive), and application of the face bow, in all, taking about ten minutes extra time. In the laboratory the models are now tied together in the trial plates by a length of strong cord or rubber elastic, then with plaster fastened to the articulator, the bows of the articulator preferably (not necessarily) kept parallel with the occlusal plane. This having been accomplished, the articulation spring and joint slides are loosened, the bite gauges reinserted, and the joint slides of the articulator set thereby to correspond with the condyle path of the individual, fully described in the circular accompanying the instrument. The next step is the carving of the compensating curves corresponding to inclination. With this step we now have all the conditions in the mouth concerning us in restoring all of the mechanical and many of the artistic functions of the teeth present on the articulator, and the next step is the establishment of the compensating curves in the wax trial plates. This usually varies in difficulty proportionate to two factors—the experience of the operator and the amount of the inclination of the condyle path, and with experience the writer believes that they can be carved in considerably less time than given by Dr. Clapp in his book, by 45 to 60 minutes. It is not within the scope of this paper to describe the technique of carving these curves—Dr. Clapp gives in detail an excellent method of quickly obtaining these, although the writer believes with a little experience these may be carved almost instinctively in a very short time.

This finished, in the mind of the writer, the patient should be on hand, and the curves tried in and the patient instructed to make protrusive and lateral movements as a check on the previous technique. If, in the position of the rest bite, the trial plates are not in uniform contact, soft wax should be applied to the lower wherever needed, the two stapled together as before, and the lower model should be reset on the lower bow. If, however, a discrepancy occurs in the protrusive or lateral movement, a new protrusive bite and resetting of joint slides is indicated.

SETTING UP OF TEETH.

This detail having been disposed of, the anterior six upper teeth are set up, sufficient wax being cut that their labial surfaces occupy the same position as the wax, and their incisal edges in contact with the lower wax, trying in the mouth, and if properly chosen, with the expenditure of very little time, may be harmoniously placed in position. With regard to the subject of choice of artificial teeth for form and shade, that of itself would furnish sufficient material for a lengthy paper;— the writer wishes to men-

tion, however, the value of the classification of mankind, known as temperament, in which the characteristics of the four pure types themselves predominate to a varying degree in the large percentage of edentulous patients, thus aiding in selection of teth both for shade and form. The use of stains for producing or choice of teeth shaded after Royce's formula (special mention might be made of dentists' supply companies, who furnish these teeth already shaded), the choice of the teeth with roots showing, for restoration following pyorrhea, the grinding and staining of the teeth, wear and erosion, age, enamel defects, or any particular characteristic, as well as the harmonious arrangement both of the arch and the teeth, themselves temperamental characteristics of the patient, are only a few of the points occurring in this subject. In the mind of the writer the six anterior teeth should always be tried in before grinding, for very often a tooth which seems to be harmonious in shade in the hand when placed in the mouth and ilps, cutting off the light from the upper $5/6$ of the tooth, often appears several shades too light and utterly unsuited for the case.

The six anterior teeth having been placed, the molars and bicuspid are next placed with greatest care in such a relation that, while their buccal surfaces stand out the same distance as the wax rim and run back in line with the cuspids, their buccal and lingual cusps are in contact with the lower curved trial plates. This is of the utmost importance, and if these cusps are not in contact with this curve in just such proportion is the value of proceeding careful technique lost. The upper first and second bicuspid, both sides, are first placed. This having been accomplished, the lower teeth are set in one by one, beginning with the lower second bicuspid left, ditto right, lower second molar left, ditto right, lower first bicuspid left, ditto right, then filling in the lower anterior six, giving the articulator the protrusive and lateral movement after each tooth is placed. The amount of overbite is regulated by the cusp height, and can very easily be determined by setting them in to a certain overbite and trying the protrusive and lateral movements; if interfering, lower them, if not, raising them, until a shearing movement obtains. This may be improved by bevelling the lingual of the tip of the upper incisors and the labial of the tip of the lower incisors. Regarding the sulci of the bicuspid and molars, reference might here be made to the advantage, as pointed out by Dr. Gysi, by having a well-defined sulci on both the upper and lower bicuspid region, and lower cusps partly rounded off, reducing the pressure necessary for trituration, thus increasing functional efficiency. This having been accomplished and the teeth securely waxed with hard wax, they are returned to patient's mouth, and tried in protrusive and lateral movements. Any inaccuracies here can usually be corrected by the use of carbon paper. The upper is then vulcanized, returned

to the mouth in articulator with the lowers in wax, or, if the case admits, on the articulator first, any necessary correction made, and the lower vulcanized. Then, if the case admits (in other words, if the case is made up on a metal or previously vulcanized base and may be returned to the articulator after vulcanization), the denture may be placed on the articulator and artificial mastication set up on a mixture of emery powder and vaseline, which will naturally improve the smoothness of their working in the mouth.

In this connection, a word on the subject of technique involve in changing the wax attachment to a vulcanite may be in order, for an error in this, of course, makes all the careful technique foregoing of no avail, and, according to indications, vulcanite will be in use for a considerable length of time as an attachment between artificial teeth and metal base. The enormous power of the ordinary flask press, the compressibility of plaster, and the extremely sluggish flow of rubber at 212 degrees Fahr, are all contributing factors. With regard to the first, Dr. Wilson, of Cleveland, estimates that, on the Buffalo No. 2 press, all owing one-fifth for friction for every ten pounds on the end of the handle of the press, one ton is delivered on the plunger. He also states that a molar artificial tooth may be driven into well set plaster at 1,000 lbs., showing the compressibility of plaster (which is much weakened by the addition of any agents to either retard or hasten the set), and with these facts in mind especial care should be taken and ample room for escape of surplus rubber, to insure accuracy. With respect to the application of this rational system to cases of restoration other than full upper and lower, the writer believes that in all cases excepting those not involving the bicuspids and molars, whether the artificial dentures rest on the natural roots of the teeth (crowns or bridges), or upon the mucous membrane, or upon each of these in conjunction with the other, should the principles of anatomical articulation be utilized, the face bow used, a protrusive bite taken, and joint slides subsequently set on the anatomical articulator. This involves slight changes in the technique, including the use of a different stem for the face bow when any or all of the natural teeth are in position, and, if the molars are present, either upper, lower or both, the use of a wax roll instead of the bite guage is indicated. The model having been set correctly on the articulator and the joint slides adjusted, the teeth are then set up. Curves may or may not be necessary, according to the extent of the losses in the bicuspid and molar regions. The teeth may be placed, using Dr. Snow's words, following the example afforded by the natural teeth. When the first molars are emptied the distal part of the upper overhangs the lower one and forms a guide for the emptying of the second inferior molar, and each pair as it appears finds its place by coming into contact with its opponent, already emptied, and by lateral pressure of its opponent against the inclined surfaces of its cusps, during the constant movement of the mandible.

As each tooth is placed, the lower section of the articulator should be given the protrusive and lateral movement, and the tooth so adjusted or ground that themaximum contact is secured, while the lateral and protrusive movements are made.

In cases where natural teeth are present in the bicuspid and molar region, sometimes difficulty is encountered in obtaining the balancing contact; on the other hand, one is often surprised at the manner in which a malposed tooth, as, for example, a lower molar tipping forward, harmonizes with the compensating curve.

The application of the principles of the anatomical articulation to bridge work is a subject of itself quite sufficient for a place for itself, on account of the instruments used, positions of abutments in the mouth, and other multitudinous details, each having a bearing on the procedure. Therefore, a brief mention of the sequence of the steps in handling a case must suffice, subject to modifications necessary for special features of each restoration.

The general order of procedure suggested is as follows: Gingival portion abutments made first, such as band of crown, post, and of Richmond, etc., impressions taken of all the teeth, removing these; models made with the gingival portion of the abutment mounted upon it; trial plates made from these, placed in the mouth with the abutments as before, and used in various steps in taking bite, as rest bite, protrusive bite, face bow, etc., subsequently used as carving curves if the length of the space and amount of overbite renders this necessary. Anatomical articulating surfaces may be readily made by taking a set of anatomical bicuspids and molar forms, placing them in plaster just sufficient to include their morsal surfaces, removing when set, and using the plaster as a matrix for their reproduction in wax and subsequently gold, placing them in the same manner and order as the porcelain teeth mentioned above. The appliance having been successfully fitted to the mouth, care must be taken to impress the patient with the additional pains necessary to keep the mouth in a hygienic state. In the opinion of the writer, the patient is usually credited with already knowing this, and in order to be well on the safe side, explicit instructions in the case of the denture and of the tissues should be forthcoming in every case.

In conclusion, the writer believes that Prosthetic Dentistry has recently, with the introduction of anatomical articulation, passed an epoch as far-reaching in its character as extension for prevention in the Operative branch, and while the present-day knowledge of the subject may seem extensive, its possibilities are by no means exhausted, and, as a result of the workings of master minds in the profession, daily results in the Prosthetic field will very soon be considered common-place which even now excite surprise and wonder.

DISCUSSION ON DR. CUMMER'S PAPER.

DR. TAYLOR: Mr. President and Gentlemen. I feel very much in the position of the farmer just now who was breaking in a team of colts, and he drove down a lane and came to a gate, so the thought to secure his team while he was opening the gate and he tied the lines around his leg, and in opening the gate he made quite a noise and the team ran away, and after dragging him around the field for some time some of the enighbors got the horses stopped and released him and carried him into the house. In about two or three hours he came to. One of them said to him: "John, don't you know you are an awful fool to do anything like that?" "Well, he says, I thought of that after they started." And I am just in about the same position. When I was asked to open the discussion on this paper I had no idea that I was entering into a field that I knew so little about or I would not have accepted it.

I want to say that while listening to this paper I was just thinking if this paper had been brought up two or three years ago how much interest would have been taken in it. It just goes to show that the most of us are so interested in the advance of the operative side of dentistry that we have overlooked a good deal of the advance in prosthetic dentistry, and I must congratulate the essayist on bringing this subject so forcible before us to-day, and if there is a good discussion brought up by it and most of the members took home some of these thoughts and put them into practice I am sure that he will receive the highest compliment that he could possibly get for presenting his paper.

In the technic of the impression Dr. Cummer has gone into it very fully, but I would just like to ask him one question, and that is in the uniform mouth where he suggests taking the impression in compound and then removing it before it is fully set or hardened and expanding it a little and putting in a small portion of plaster and inserting it quickly in the mouth. His plan, I think, was to get sufficient pressure on the softer tissues. Would he not get that same pressure by taking the impression in the compound and then removing it and softening it over the Bunsen, say for a depth of an eighth of an inch, and just put it in some hot water to keep it from sticking and replacing it; then you could get your model a good deal quicker and wouldn't have to wait for your separating medium the same as you would in the plaster.

I think the point brought out of the tissue in the anterior part of the mouth being so soft and flabby, there isn't a doubt that every one of us has come across these cases and has found difficulty in getting an impression of these tissues. I think the way Dr. Cummer has put this before us is excellent, and no doubt you will get a first-class impression.

The point brought out of the plaster exerting equal pressure on all sides of that soft tissue I am sure is worth a good deal to the members of the profession. The separating medium that he pre-

sented to us, I have never heard of or saw until I ran across it in his paper, but I understand some of the other members here have used it and say that it is excellent. He did not explain just what the advantage was unless it was the quick drying of it. I should think that methylated spirits or alcohol solvent and that gum shellac would dry much quicker than the borax and water solvent, but I should think there would be quicker evaporation with the alcohol.

I think the most of our failures in getting these models is the thinness that we run them, that is, we do not get sufficient thickness over the highest part of the impression, and that would have a tendency to cause buckling, and I think another thing that would probably lessen that tendency would be the separation of the model from the impression as soon as possible after it was set, and the expansion would not be forced in any one direction.

I think Dr. Cummer brought up the matter of the expansion of models lasting up to about ten minutes, and then contraction taking place in the next twenty-four hours. I see some authorities say that expansion takes place for 24 hours, and I think that probably Dr. Cummer could give us a little more light on that in closing the discussion.

Now, in the technique of getting the compensating model. I do not think there is any room for discussion on that matter, unless it would be instead of placing those lifts on the model, would we not get just as good results by scraping the impression before pouring the model. These lifts, no matter how well they are pinned, sometimes move, we wouldn't have that objectionable feature, and when I get a model I often scrape a slanting curve at the head of the posterior portion of the plate just about where I expect the plate to extend back, and then I have less liability for leakage in the soft tissues.

In speaking of base plates, Dr. Cummer mentioned several base plates and also the vulcanite. Now I find—I do not want to advertise any particular base plate, but there is a base plate called Craft's base plate which I find is excellent. It gets just as rigid, practically, as vulcanite, and is very quickly adapted to the model.

The point brought out of the cone of wax I think is an excellent one. Every dentist I think has had difficulty in getting the proper rest bite, and I think that cone of wax would serve an excellent purpose there. It not only gets the tongue back, but takes the mind of the patient away from the bite, and in that way you are more liable to get a good rest bite.

In setting up the teeth Dr. Cummer, I think, sets up the six anterior teeth first and then the bicuspids on one side and then the other. Now we have gone to a good deal of pains in securing that condyle path and compensating curve, and I should think if you set up the upper teeth on one side from the centre right back and not disturb the condyle path on the other side, you would have your proper

relation in case anything had to be changed, and when you got one side set up and got it in proper relation to your condyle path then you start on the other side and you have the side that is already set up as a guide, and in setting the lower ones you practically have to set the posterior teeth first, because at the present time we cannot get anterior teeth to articulate very closely with the upper ones, and after we get our bicuspid and molars in place then we know just what space we have for our lower anterior teeth.

I am sorry that the essayist had not more time to go into the question of selection of teeth, but it is really, I think, a paper by itself, and no matter how well we conduct our preparation of models and the condyle path, we are liable to go to work and spoil all our work by putting in objectionable teeth, that is, teeth that are too narrow or short, and then there is the over-bite and such like to be gone into, which is quite a paper by itself, and we haven't time to go into it.

Now I am not going to take up the discussion or criticize the subject of the condyle path. I do not think that any person has put it into better shape than the essayist. He has gone into every detail, and while some of the members who have not taken up the study of this condyle path to any great extent, might think that is quite a complicated affair. It really is not, and the only way you will find it is to get down to work and do it. After you have once done it you will find you are well repaid at any time for taking up that part of it, because it is of the greatest assistance in getting the proper relation of the teeth.

Now I think the time is quite limited and I have pretty nearly got to my limit, with the exception of congratulating the essayist again on this paper, and I think that this meeting owes him a very hearty vote of thanks for bringing this subject so well before us, and I only hope that the members will give it a full discussion.

CHAIRMAN: I am going to digress just a little here. Our time is passing rapidly and I am going to just leave a few minutes before asking Dr. Cummer to close the discussion. If any one wishes to ask a question I am going to limit that to one minute, with your permission, and then again any of you who wish to ask Dr. Cummer any questions in regard to this, even though you may not have the opportunity to ask him, or if you do not have it, write it out and hand it to Dr. Cummer or one of the executive, and we will see that he gets it. He will be on the programme to-morrow afternoon and can go into this more fully. This is a subject we could spend all the afternoon and evening on, and then not settle it, and we cannot tread on the other paper. We are just a little late in starting. We can afford just a few minutes yet if any one wishes to ask a question, and Dr. Cummer can answer it in closing this discussion. I will ask Dr. Cummer to close the discussion for this afternoon and reply to Dr. Taylor, and I know that there are many points in paper that some of you would like to hear discussed

a little further, and I think that would be a very good way to have that handled, to have you write that out and hand it in to the Secretary or Dr. Cummer sometime before noon to-morrow, and he can make any explanation to-morrow afternoon when he is on the programme again. I will ask Dr. Cummer to close the discussion.

DR. CUMMER: Gentlemen, I feel very much as your President does, and have felt so for the last half hour, that this is a subject which it is almost impossible for anybody, unless he is a genius at making things plain before an audience, to bring out satisfactorily before the minds of an assembly such as this without spending more time on it in the elaboration of the various points and, consequently, a little more practical demonstration. Now, to-morrow in the clinic I hope to make a great many of these things that probably appear cloudy to you very much clearer with the models I have over there and others which I have not shown you, and I hope any of you will take advantage and allow me the privilege of doing everything I can to make the thing clear to any of you who are interested in it.

With regard to Dr. Taylor's first question. He asks if an impression taken in compound and reheated to probably about one-eighth of an inch would not answer as well as plaster. I think it would in a great many cases, particularly so in the case I mentioned, but in my own hands (I may not know how to handle compound properly) but my difficulty in that technique is in getting the fine lines perhaps with a certain little under cut here and there. I can get along very much better with the thin plaster of Paris, and it doesn't take very long, but I am sure that Dr. Taylor would get good results quite as well as I or any one else would by the method he suggests. I find that method very valuable in those cases in which the mucous membrane of the arch is hard and shiny and saliva very, very thin, and you all know what beautiful cases they are. I think that is specially adapted for that particular class of case.

The advantage of the separating material is that it dries quickly. I can get that to dry in three minutes by my watch with compressed air, and I haven't been able yet to get anything with alcohol or anything that is of an intemperate nature to dry any quicker than about ten minutes.

With regard to the expansion of plaster mentioned by the doctor. My information is obtained from Dr. Prothrou's text book. He, I think, has done more than any one else that I know of on the subject. He has constructed a special machine for reading off the expansion or behavior of plaster of Paris after it has been set, and in his last text book he speaks of the models as expanding for 10 minutes and contracting very, very slowly for 24 hours. Of course I do not suppose he intends that it holds good for every variety, because it seems that different plasters differ very greatly for many different reasons. That 24 hours is probably misleading. The contraction is very slight during that 24 hours. Of course the plaster

itself is very much expanded in the ten minutes, so much expanded in the ten minutes that the contraction which extends over the 24 hours subtracts very little from that expansion. Perhaps I didn't make myself very clear there.

With regard to the advisability of scraping the impression. There are many men that are doing that and doing is successfully, but for a man beginning to treat models in that way I think more accurate results can be obtained by making additions to the model, because if you make an addition and you do not make it deep enough you can very quickly determine that by pinning it on and laying a sheet of soft wax base plate over it and bring it back into the mouth to make sure of it. If you scrape your model, that is not quite so easily done, because if you scrape your impression too much your model at that point will be too high and you have to scrape that. I think the other is perhaps a little easier, but I am sure that the doctor and many others could secure quite as good results by treating the impression rather than treating the model.

With regard to setting up the teeth. I think I didn't make myself very clear on that point. The doctor has evidently got the impression that I recommend, after carving the curve, setting up the teeth one by one, running back alternately from either side. What I really meant, if I did not express it very well, was, in the edentulous case where they are thoroughly carved, to set up all the upper teeth and then start with the lower bicuspid, alternating from side to side. After the curves are carved, set up your anterior six, try them in the mouth, and get them arranged harmoniously; then set the upper bicuspid and molars right back; then begin on the lower bicuspid on the right side, then on the left side, then the lower first molar on the right and then on the left, then the lower second on the right and on the left, then filling in the others, giving each tooth the lateral protrusive movement.

I wish to thank you very kindly for the attention you have given me under probably distressing circumstances.

THE SELECTION OF A ROOT-FILLING MATERIAL.

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Read before the Dental Society of Western Canada, at Winnipeg, April, 1911.

Among all the root-filling materials used, there is not one which fulfills all the requirements of a perfect root canal filling. The best that can be done is to select the one or the combination which will the most nearly suit the conditions presented. If all root canals were of like form, and all the pulp could always be removed, and all were in an equal state of asepsis, and all the apices of equal size, and all the tissues at the apex of equal resistance, and

all equally accessible, then there might be selected a universal root canal filling. The very difficulty of making a selection of a proper filling material for each case makes this department of dentistry worth while. Most of the failures in the management of root canals can be traced to misjudgment or a want of knowledge of the conditions presented. The experiments indicate that no matter what root filling material is used, the occlusal part of the root canal and pulp chamber should be filled with oxy-chloride of zinc.

Root canals of normal size and accessibility, in which the pulp has been recently devitalized by arsenic or cocaine and the pulp completely removed under aseptic precautions and no moisture or irritation exists at the apex or in the pericementum, should be filled with a mechanical root canal filling or an antiseptic—mechanical—filling. For this purpose there is nothing which so nearly fills the requirements as chlora-percha to fill the apex, and into this pressed a suitable sized gutta-percha cone, and over all placed oxy-chloride of zinc.

Technique of filling root canals with gutta-percha and oxy-chloride of zinc is exacting in detail. Haphazard methods as often described by authors who have either not used the material or never examined the results of their work, are always failures. 1. The consistency of the chlora-percha must be such that it can be carried to the canal with a smooth broach; it should not be so liquid as to drop from the broach, nor should it roll up upon it when rubbed against the walls of the canal. The fibre should be long and draw out as the heat rises. 2. The canal should be perfectly dried and the walls then moistened with oil of cajeputi or eucalyptol. This may be done by carrying an excess to the cavity and pumping it into the canals and then wiping the excess out with wisps of cotton wound on a broach and passed into the canal, or by moistening cotton wound upon the broach in the oil and passing this up the canal. The purpose of moistening the walls of the canal with a solvent of gutta-percha is to induce it to pass into the fine extremity of the canal. The lubricant serves the same purpose as the moisture in an investing flask where plaster of paris is used. It is next to impossible to fill fine dry canals with chlora-percha by pumping it in with a broach; they might be filled under pressure. 4. The canal having been moistened, the largest smooth broach which will comfortably enter the canal should be dipped into the chlora-percha and carried to the canal and pumped in and out, having in mind that the object is to fill the canal with chlora-percha. The broach may need to be dipped into the chlora-percha several times before enough will be carried to the canal to fill it. The pumping should be continued until the patient gets a sensation which should be constantly inquired for. Otherwise some patients might think the irritation caused by pumping chlora-percha through the end of the root a necessary part of the operation. There may not be any sensation, but the operator should

satisfy himself that the solution has gone well to the apex. 5. A gutta-percha cone of suitable size and length is selected and grasped with a pair of dressing pliers and directed into the canal and carried as far as possible. If no sensation is felt, or there is some doubt if the point has reached the apex, a square-ended root plugger is directed upon it. It is always advisable to select a cone large enough to fill the whole canal, but if this has not been done, or the canal is of such a shape that a cone will not fit it, several cones may be packed into the canal. It is not advisable to heat the gutta-percha cone or dip it in a solvent before placing it in the canal. The cone should be kept as rigid as possible, so that it may be forced to the apex. If there is any reason to believe that the cone has not gone to the apex the root canal plugger may be heated and then dipped into vaseline or an essential oil to keep the gutta-percha from adhering and the contents of the canal well forced upon. This will force the gutta-percha to the apex, but it will just as certainly expand the gutta-percha in the outer part of the canal, which will afterwards contract and leave spaces. It will also poke the gutta-percha full of holes which are impossible to fill. The object is to fill the canal as tightly as possible with gutta-percha, consequently there should be as little of the solvent in the chlora-percha left when the operation is completed as possible. The filling should be cool and without porosity when the final pressure is relieved. The rule should be not to warm the gutta-percha. Make a few experimental fillings in a conical glass tube and compare the results of dry and lubricated walls and cool cones packed to place and heated cones packed with root canal pluggers. 6. After a little experience, there will not be enough gutta-percha used to fill the outer part of the root canal or the pulp chamber. If there is any excess of chlora-percha remaining, it should be removed. Oxy-chloride of zinc should be mixed to such a consistency that it can be readily carried into the canal and pulp chamber and firmly packed. The primary setting of some examples of oxy-chloride of zinc is often very annoying. It hardens to the point of crumbling almost as soon as it is mixed, and then it takes several hours to become finally hard. The samples with a thick syrupy liquid are more tenacious, and do not seem to have a primary and secondary setting so far apart as those with a thin liquid. If the mass sets too quickly a few drops of a saturated solution of boracic acid in the bottle of liquid will correct it. If need be, the oxy-chloride may be formed so as to act as a seat for a permanent filling.

MERITS AND DEMERITS OF THE FILLING.

Chlora-percha is as permanently antiseptic without loss of bulk or irritation to the tissues as any single or combined materials known. It is capable of being carried fully to the ends of a root without wounding the sensitive tissues. The cones which follow

are flexible yet rigid, and when being carried to place the excess of chlora-percha is squeezed out, thus filling the canal as far as possible with a solid. Even if the cone does not reach beyond the apex, it is immersed in a solvent which will round the point and prevent irritation. Gutta-percha itself is a non-irritant. Knowing that the gutta-percha is either porous or leaks, the object is to leave as little space as possible for moisture. Make the canal as nearly mechanically full as can be. There is the antiseptic in the chlora-percha to prevent infection. Besides this, there is the oxy-chloride of zinc in the outer part of the canal which acts as a barrier to infection of the canal from the crown. The color is pink, which is of sufficient contrast to make it easy to follow if it has to be removed. Gutta-percha is easily removed either with a reamer or by softening it with heat or a solvent. Cajeputi sealed into the cavity for a few hours against the gutta-percha will soften it, so it may be readily removed with a Kerr or Downey reamer. Chloroform is the most rapid solvent.

The objection to a complete root canal filling of oxy-chloride of zinc is its irritating properties. It may be safely predicted that either the apex is not open or the canal is not filled if there is no irritation from an oxy-chloride of zinc root filling. The irritation is severe and often sufficient to make a permanently lame tooth. There is also the insurmountable difficulty of removing an oxy-chloride root filling. It is the same color as the dentine of the tooth and so hard that a drill or reamer will not follow it. In combination with oxy-chloride of zinc and gutta-percha all the virtues of each is maintained and few of their faults.

Fine Root Canals, in which all the pulp has been devitalized by arsenic or pressure anæsthesia, and removed, and there is neither pain, soreness nor moisture, may be filled at once by the same method as that of the previous case, with these modifications. It may be found impossible to pump the chlora-percha to the apex with a broach, in which case the pulp chamber and as much of the canal as convenient may be filled with chlora-percha, and over this placed a piece of vulcanizable rubber sufficiently large to confine the chlora-percha, and upon this pressure is brought with as large an instrument as will enter the cavity. Pressure should be applied gently, giving time for the air in the canal to escape through the tissue and allow the chlora-percha to reach the apex. In many of these cases it is impossible to get a gutta-percha cone to enter the canal. The excess of chlora-percha should be wiped out and the oxy-chloride squeezed into the canal as far as possible. It often occurs in an upper molar that the lingual root canal can be readily filled, but the buccal roots are so fine that access is difficult and gutta-percha cones cannot be used. Though it is more convenient to pump the chlora-percha into all three roots at the one time, it should not be done. The large root should be completely filled first and then the chlora-percha filled into the pulp chamber

and pressure brought upon it with raw vulcanite, as before described. If pressure were used when all three canals were open, the large one would be over filled or the small ones would not be sufficiently filled.

Fine Root Canals, from which all the pulp recently devitalized has not been removed though an intelligent effort was made, should be treated so as to preserve the remaining pulp tissue in such a condition that micro-organisms will not grow in it. Dryness and antiseptics are the chief hope. The small quantity of material and the fineness of the apex are favorable factors. Other things being equal, the permanency of a disinfectant depends upon the slowness with which it gives up its disinfecting power. Disinfectants are useful as such in proportion to their power to destroy organic life. If they will destroy vegetable life they will destroy organic life as found in animal tissue. Hence disinfectants are irritating, and if used in a root canal at all, their irritating power must be so masked or allowed to come in contact with the living tissues in such minute quantities that there is no poisonous action. To this end antiseptics of the most lasting character should be used in combination with some substance which will not allow a rapid loss of the drug's antiseptic power. There have been many successful methods of mummification of the dental pulp recommended. Such drugs as abstract moisture and are of the aromatic variety have had greatest favor, thymol, tannic acid and glycerine to make a paste, or oxide of zinc, thymol and creasol and formaldehyde. Formaldehyde is so irritating that a good deal of the solid should be mixed with it to prevent its rapid dissipation. Oxide of zinc and oil of cloves has been much used. If there is any difficulty in getting the solution well into the canal, and there usually is, a non-irritating antiseptic should be used, because when vulcanite pressure is used there is no certainty that a little of the drug may not be forced through the apex. As much of the paste as possible should be worked into the canal, and if need be pressure applied and then a gutta-percha cone forced as far up the canal as possible and a covering of oxy-chloride of zinc applied. Balsam of Peru has been recently recommended for filling such canals. It is an aromatic thick brown liquid, easily forced into fine canals.

Root Canals which have been the Seat of Infectious Matter for a long period, or there is some uncertainty as to the state of the tissues beyond the apex, should be filled with a disinfectant or antiseptic root-filling material. Dr. J. Szabo, Budapest, Germany, believes that a root canal once the seat of a prolonged infection can never be wholly sterilized. There would seem to be some evidence in practice to substantiate this view. A tooth which has once been the seat of a violent infection is more prone to another attack than it was at first. Even if the second acute attack does not occur, the pericemental membrane seems to lose its vitality after a number of years, and the tooth is ever afterwards lame. If an

acute alveolar abscess has occurred without much involvement of the pericemental membrane, as occasionally happens, the future of the tooth is more hopeful. A mechanical root-filling material is rarely satisfactory, in such cases creosote, oil of cloves, thymol, artisol, paraform, alphozone, acitizone, creasol, and formaldehyde are advisable. One or more of the liquids mixed with one of the powders or oxide of zinc to form a paste, and followed in the canal with a gutta-percha cone and covered with oxy-chloride, is a satisfactory filling. Balsam of Peru is used in these canals. The size of the apex, and the pathological condition of the canal, and the tissues beyond, determine the power of the drug used. If the root canal is very fine and there is any reason to believe that it has not been cleaned out to the apex, do not, under any circumstances, force the root canal filling in under vulcanite pressure.

Root Canals which have been the Seat of a local infection for a short period, or the pulp has not been removed immediately after its death, and there is no reason to believe that there is any mechanical or chemical irritation of the tissues beyond the apex, or a penetration of the tissues of the tooth with infectious matter, the root canal should be filled with gutta-percha and oxy-chloride, as before described.

Fine Crooked Root Canals in which the Pulp is not all Dead, and it would be unwise to poke arsenic to sufficient depth in the canal to destroy it, and if it were destroyed it would be impossible to remove it, and there is no reason for an immediate completion of the operation, may be filled by squeezing a solution of phenol into it, followed with one of the other antiseptic root fillings.

Root Canals which have Large Apical Openings, or canals which have been punctured in operating, or root canal of temporary teeth which have been the seat of infection and are otherwise ready for filling, may be satisfactorily filled at the point of opening with Beck's Bismuth Paste. The paste may be warmed and carried into the canal with a heated broach or by pressure from vulcanite.

FORMULA FOR BISMUTH PASTE.

Bismuth Subnitrate	30 per cent.
White Wax	5 per cent.
Paraffin (Melting Point)	5 per cent.
Vaseline	60 per cent.

Mix while boiling.

PUNCTURED, ABSORBED AND FRACTURED ROOTS.

Roots which are punctured in operating and the root canal aseptic should be filled at once with some substance such as gutta-percha, otherwise the tissue will penetrate the opening into the canal and become irritated by the rough edges and infected, with but little chance of successful treatment later. Roots of the anterior teeth punctured by decay more than three or four millimeters below the gum can rarely be successfully treated. When the tissue

is being pressed out of the cavity a peridental inflamed is almost certain to occur. Punctures by decay in the subpupal wall of molars is not much more amenable to treatment. If the canals are not infected or can be readily treated and brought into condition to fill the case simplified. The protruding tissue may be anæsthisied and removed with a large spoon and the surface cauterized with phenol, and at the next sitting gutta-percha placed over the opening. If the puncture is small, and little or no previous infection existed, such cases often remain comfortable for years. Such cases are doubtful as supports for crowns and bridges.

Roots of permanent teeth absorb when there has been excessive irritation either from over work or from infection. As the end of the root is absorbed, the root canal opening becomes large. Though the future of such roots is not bright, they may be made comfortable and useful for years. The canal when brought into proper condition should be filled at the apex with bismuth paste. Occasionally irritating drugs or unwise instrumentation has caused a liquid exude to come from an apical opening, which is abnormally large, every time the dressing is removed. Dentists have been known to continue to irritate the tissues at the end of such roots with instruments and poisonous drugs for months and even years without knowing that their treatment was the sole cause of their trouble. All such cases need is to be allowed to heal. The canal should be dried out as carefully as possible and bismuth paste, paraffin or gutta-percha squeezed tightly into the apex; over this should be placed a test filling for some time. In no case is it wise to go on treating a root canal for weeks and months. A correct diagnosis will obviate many useless treatments and much loss of time.

Fractured or Split Roots can never be successfully bound together and the root filled. Infection will certainly occur in the line of a fracture and be a source of irritation while ever both of the fragments remain. If one fragment is not well enough supported to retain a crown or filling they should both be removed.

Root Canals in which Broaches have been broken and cannot be at once removed are among the most difficult accidents to deal with in dentistry. If there is room in the cavity to grasp the end of the broach it may be easily removed, but must be attempted with care. If it is out of reach of everything except another broach, and the canal is fine and the root difficult of access and the canal not infected, it might be as well to fill it with a disinfectant root filling at once. The chances for its removal are remote indeed. Better to leave it than puncture the root in attempts to drill it out. If the canal is infected and the accident occurred in attempts to relieve pain from an abscess, there is little hope for the root. Even if the abscess is open from without, it will likely recur because of the remaining infection in the canal. Magnets and solvents of the steel have been recommended, but the cases in which they succeed are very rare. Iodine has been recommended by all

the dental text-books since some one thought of it who knew of its corroding power on steel. The difficulty is the agent cannot be gotten in contact with the steel where it is tight in the canal.

DISCUSSION.

Dr. Webster has given us a good general view of this particular phase of dentistry and he has divided root canal filling materials into eight different classes. This demonstrates that the dentist who uses only one class of filling material is not rendering the highest type of service to his patients. Root canals are filled for the dual purpose of sealing the apex from infection from the tissues beyond, and also for the purpose of preventing infection from the oral fluids of the cavity end.

Dr. Webster's exhaustive experiments along this line in the Royal College of Dental Surgery have proved quite conclusively that the only filling at the cavity end which may be depended upon as an effectual barrier to infection is oxy-chloride of zinc. I have no doubt that Dr. Webster will be highly pleased to find that I thoroughly agree with him that his selection of filling materials for the various classes cannot be improved upon, and I have no doubt that he will also, in turn, agree with me that a very small percentage of our root canal fillings completely seal the apical foramen. However, in this regard it is our duty to do the best we can, and I believe that in the first and fifth classes that gutta percha points lubricated with chlora-percha are the best we have at our command.

I would like to ask Dr. Webster how he obtains and keeps the right consistency of his chlora-percha and also how he keeps his chlora-percha aseptic, and how he sterilizes and keeps his gutta percha points aseptic. I have found that aristol added to the chlora-percha will give beneficial results, and that keeping the gutta percha points in boracic acid is also very good. I have no doubt those having sterilization chambers using formaldehyd will be able to make use of those. In this connection I might note a point that does arise, to avoid contamination of your chlora-percha by taking it from your container and keeping it on a glass slab while you are introducing it into the canal, to avoid contamination of your general solution of chlora-percha.

With regard to selecting points, I prefer the rounded to the square, as I find that they fit the canal very much better. In connection with introducing the point into the canal Dr. Buckley has suggested a solution of two grains of phenol, three grains of menthol and one dram of eucalyptol for moistening the canal. I have found this to work very satisfactorily.

The method of using pressure on chlora-percha in fine canals cannot be improved upon, as it is practically impossible to force a slender, attenuated gutta percha point down these very, very fine canals. The operation of forcing the chlora-percha through under

pressure is perhaps somewhat mussy, but the result amply atones for the muss.

I have used mummifying pastes in some of the cases of class 3 where you have fine canals with the pulp not all removed and a modification of oxyphenol in class 4, where the canals were infected for some time, but I have had a somewhat lingering suspicion, although I have met with success, that there would eventually be a shrinkage of the canal filling. I would like to ask Dr. Webster, or any one else, as to whether any experimentation has been carried on along this line to determine the amount of shrinkage you may find where gutta percha points are inserted into canals primarily filled full of a paste. Beck's Bismuth Paste I have never used, but if Dr. Webster says it is all right, I have been under him long enough to say that I will use it.

The primary setting of oxychloride of zinc is very troublesome. I have used Ames', and I find that the primary setting gives a good deal of trouble. I have tried by introducing the powder and mixing the liquid with it in the pulp chamber in some cases to get it into the opening of the canal before the primary setting takes place, but I did not meet with complete success. I had intended asking Dr. Webster where he obtained his syrupy liquid.

In regard to filling a root canal with oxyphosphate of zinc, I am entirely in accord with Dr. Webster. It is very annoying to have somebody else's patient come into have a root canal opened up that is filled with oxyphosphate of zinc; it makes you lose a good deal of faith in the other fellow's judgment.

At present we must use different canal fillings, for the simple reason that the ideal canal filling has not yet been obtained, but I have been daily in hopes for some years that some inventive genius like Dr. Bush might possibly evolve some scheme by which we could obtain a wax impression of the interior of the root canal.

In conclusion, I can only congratulate the society upon this admirable paper on this very important phase of dentistry.

Dr. Hartzell: Gentlemen, I am putting notes down for my own private information. They are so valuable that I want to preserve them to use myself. It was not to offer any further discussion. But I am thoroughly in accord with everything that has been advanced in that paper. I noted on the programme we were to have such a paper, and I did not try to discuss that phase of the question, because I already have talked too much.

There are two things, however, in this connection, two preparations that I have used with a great deal of satisfaction, one for quite a good many years, in the case of those canals that need permanent antiseptic dressings that will not irritate the tissue beyond the root and still give some antiseptic power for a long period of years, and if you care to listen I will give you the formula of the one which is paraformaldehyd, 1 part; zinc oxide, 2 parts; thymol crystals, 1 part. Now, then, if you care to use it have your drug-

gist add just enough glycerine to hold it together. The mistake that will probably be made will be to put in so much glycerine that it will be too liquid when you want as solid a mixture of these elements as you can get, so that it will have some body in introducing it into the canal. I have used that, in fact I have made up in quantities for use in the college clinic, and where you have faith enough in the thing to turn the boys loose with it that way it indicates that I, at least, believe that it is a safe thing to use.

Now there is one other point that I gained quite recently, and I cannot tell to whom I should credit it, but I have a suspicion it is Dr. Buckley, but I am not sure. It is one that, to remember it myself, I put it down in my note book here and I will give it to you: Calcium phosphate precipitate, 1 dram; thymol, $\frac{1}{2}$ dram. Keep that in the form of a powder and when you care to use it combine it with a sufficient amount of cresol and formaldehyd in equal parts to make a paste. It is rather elusive and rather difficult to introduce, but in cases of children's teeth where you have a pulp chamber and canals that have been infected for a considerable period of time and even abscesses in which you feel a decided disinclination to penetrate the root tips and still you wish to maintain those teeth in position to await the succeeding so-called permanent teeth. It makes a valuable preparation to pack the pulp chamber, and oftentimes a thorough washing out with warm water and any antiseptic you choose and then drying the chamber and root canals as far as you can with hot air and an absorption of sponge or cotton and introducing that paste into the canals and pulp chamber and covering it with a cement will give you a surprisingly satisfactory result. It seems in some cases in which I have used that that I have reaped a meed of success I had no right to expect, and I am sure some of you may find those two things beneficial.

Now when I vouchsafed the opinion that the way to open up root canals was with sulphuric acid, of course I did not qualify that by saying that I knew there were a lot of canals that were so crooked that you could not introduce the brooches, but as a general practice all those that can be opened at all may be opened in that way, and if we are unfortunate enough to have these crooked canals (and we can bank on the fact that we will be so unfortunate in many cases), the methods advanced are just exactly those that I am using in my own work, and particularly the infiltration of the delicate fibre of the pulp that you cannot get at with a strong solution of phenol, is about as satisfactory as anything, and then, if you choose, cover that stump with this paste made of paraformaldehyd. Now paraformaldehyd is a solid and it is very insoluble, and it will give off its devitalizing, mummifying influence for years, and thus it is the most suitable of any of the things that I have experimented with, and when you buy it you will have to ask for that particular thing or they will give you something else, and it is an insoluble, apparently inert, white powder, but if you heat it you

will find out that the active property is there; there is plenty of kick in it.

Q. What do you do when there is secondary dentin and the pulp is still alive?

Dr. Hartzell: You just take the high pressure syringe and then you have just got to fiddle down until you get to it.

Q. Supposing you cannot get into the root and still there is a piece of the pulp at the apex, but the other portion is filled with secondary dentin?

Dr. Hartzell: You mean there is no opening at all? You cannot get access to that which is up there at all?

A. Yes.

Dr. Hartzell: It is perfectly solid?

A. Yes.

Dr. Hartzell: Well the only thing you can do is bore down and fish along until you get to it, and if you have to why I presume you can desensitize it with high pressure. You cannot do anything with low pressure anesthesia; the only thing is high pressure. That will give you time to operate upon it or you may put cocaine of any kind around the neck of the teeth or in the gum and that will desensitize the pulp until you work down into the root.

Chairman: I will call upon Dr. Webster to close the discussion.

Dr. Webster: The question of chlora-percha is an important one. You know, unfortunately, the chlora-percha at the present time is very largely loaded with oxide of zinc or clay or something else, I don't know what it is, so that the first thing you should do would be to get perhaps a very fair solution of the chlora-percha and then strain that through two or three thicknesses of cloth. That will take most of the oxide of zinc or loading matter out of the gutta percha. You will have a fairly syrupy liquid which may be drawn out to almost any length. Next take some thymol crystals and bring them into solution either in chloroform or alcohol and add that to the chlora-percha. Then you will have a solution of chlora-percha and thymol. Next pour some cajuput into the chlora-percha, and as the chloroform gradually evaporates, which it will do, add more cajuput, until finally it will be largely gutta percha and cajuput and thymol, which does not readily become hard. It will stand for two or three weeks without any very noticeable change. The cork should fit over the outside of the bottle in which it is contained and should fit fairly tightly; then have an attentive assistant.

I have found it satisfactory to keep gutta percha points in alcohol, but they lose a little of their rigidity in alcohol, and I would like to know if Dr. Croll has noticed a similar result in boracic acid.

Dr. Croll: I just keep them in the powder, not in the solution.

Dr. Webster: Well, I would not feel as certain about that being aseptic, but in alcohol of course we are perfectly sure of it.

Now the medicated root canal filling certainly does contract, there is no doubt about it.

The question of paraformaldehyd I am very glad Dr. Hartzell introduced. It is one of the very best drugs for those cases in which he has recommended it. It will very slowly give off the formaldehyd. The formaldehyd in the liquid state gives off the gas so quickly that the chances are there is irritation.

PLACE OF MEETING.

Chairman: The first item is the question of the time of the next meeting. We have a difficulty here when we meet within a month or two of the Canadian Dental Association. A great many of the western men do not care to attend our convention and then six weeks after go on again to Toronto and attend the Dental Convention there. Dr. Matheson this morning suggested a very good way out of that, and I would like to hear just a little discussion on that, so that the executive may know what steps to take for the next meeting. I am going to ask Dr. Matheson to make that suggestion public this afternoon.

Dr. Matheson: Mr. Chairman, the suggestion I made to Dr. Garvin this morning was that our meeting here should be held a few days previous to the meeting in Toronto, whatever time they sat. That would mean that the men from the west could take in our meeting, go on to Toronto, and it would only necessitate their leaving their home town two days before they intended to leave in order to reach the Toronto meeting.

Chairman: I should like to hear from the President of the Canadian Dental Association on that point.

Dr. Cowan: Mr. President and Gentlemen, as you have mentioned this, Dr. Matheson spoke to me this morning about it, and yesterday I may say that Dr. Webster, Vice-President Bush and myself met together with the representative from Alberta and discussed the next meeting of the Canadian Dental Association. We do not know yet that it will be held in Toronto. What we decided to do was to immediately confer with the Ontario Dental Association and try and arrange a meeting with them, the same as we had last year, a joint meeting with the Province of Ontario. It will be held in the Province of Ontario somewhere, either Toronto, Hamilton, Ottawa or London. The date is not yet fixed, but it will most likely be sometime in June of next year. Now I would suggest, if it is your intention to carry out the proposition of Dr. Matheson, that you leave the fixing of the date just a little while, and we will consider you when we are arranging for the Canadian and Ontario Dental Meeting, and then we will notify you as to the exact date. Your executive could then fix the date to suit the other meeting, and we will try to arrange it to suit as far as we can the date that you have had in this district. I think in that way we can arrange so that everything next year will be covered in a way that will make every meeting satisfactory and a success.

Chairman: I would like to hear from one outside man from the West. A great deal has been said here about having our meetings at a time when the farmers were busy and the men from the outside points could get in easily.

Dr. Croll: As I remarked at a previous meeting March is a very bad month, as the dentists in the country are usually very busy up to the time that the farmers commence seeding.

Chairman: How about June?

Dr. Croll: June is the time of the Military Camp, as a rule, and I believe that Dr. Johnson, Dr. Hackett, Dr. Duff and a couple of others and myself will be exceedingly engaged about that time. As a rule, though, it is the latter part of June, and if the date for the Manitoba meeting or Western Canada meeting was fairly early in June they could not complain.

ELECTRICITY FOR DENTISTS.*

F. D. PRICE, D.D.S., L.D.S., TORONTO.

CHAPTER II.

STATIC ELECTRICITY AND CURRENT ELECTRICITY.

Vulcanite or resinous substances, such as sealing wax, if rubbed with a dry woollen cloth or fur, acquire the property of attracting to themselves light substances, such as bits of paper or pith. The mechanical friction has generated on the surface of the vulcanite a *charge of negative electricity*. The wool or fur will be found to be *positively charged*. The negative charge on the vulcanite induces a positive charge on the pith ball. These two opposite charges of electric energy cause the attraction between the vulcanite and the pith or paper. The pith will be attracted to, and adhere to, the vulcanite, but if forcibly removed will now be as strongly repelled by the vulcanite. The pith has taken *negative electricity* from the vulcanite. The two negatively charged bodies repel each other. If now a glass rod be rubbed with a piece of silk the glass will become positively charged, and will strongly attract the negatively charged pith ball. The silk will be found to be negatively charged. Following out an investigation of this kind, we are able to arrange many substances as positive or negative in relation to each other. The following table is so arranged each substance named being positive in its relation to those following:—

- | | |
|------------------------------|-------------------|
| 1. Fur. | 7. Wood. |
| 2. Wool. | 8. Metals. |
| 3. Some resinous substances. | 9. Sulphur. |
| 4. Glass. | 10. Other resins. |
| 5. Cotton. | 11. India rubber. |
| 6. Silk. | 12. Gutta percha. |

Bodies charged with one kind of electricity repel those charged with the same kind and attract those charged with the opposite kind. Or, we may say, that like kinds of electricity repel but

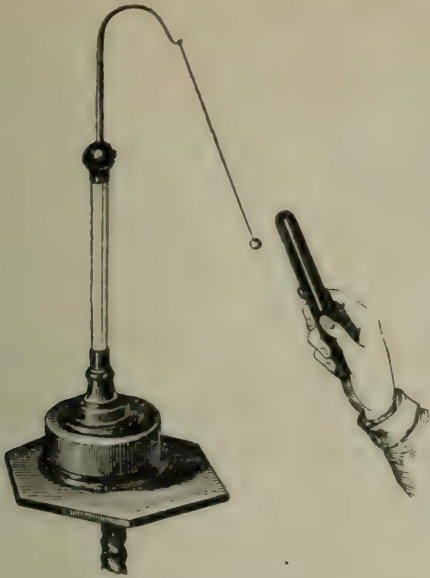


Fig. 1—Showing pith ball attracted to the charged vulcanite



Fig. 2—Showing pith ball repelled by the charged vulcanite

unlike kinds attract each other. The difference between positive and negative charge is called electric pressure or potential. Small bodies can contain only relatively small charges, but large bodies may contain large quantities of electric energy and be intensely or highly charged. If those of opposite charge are brought near each other the electricity will pass from one to the other through the air, causing an electric spark. This is noticed in small degree in combing one's dry hair with a vulcanite comb. Some people can rub their feet over a dry carpet and so charge their bodies

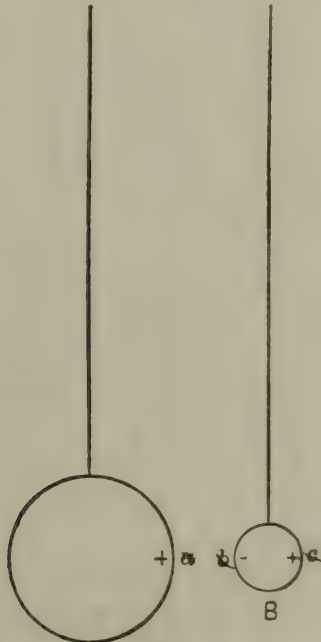


Fig. 4—Brass ball B charged by induction from A

that a spark may pass from their finger to a gas jet and light the gas, or to another person, giving them a slight shock. This spark is seen in larger degree between the poles of an induction coil or static machine, and in the great discharges between rain clouds or between a cloud and the earth, in the form of lightning.

A charged body brought near a neutral body *induces* on the side of the body nearest it an opposite charge. Fig. 4. A, a brass sphere charged positively, is brought near B, another sphere not charged. There will be induced in B a negative charge nearest to A, while a positive charge will appear on the opposite side of B. The charge in B is developed by *induction*. Whatever force was used to charge A also produced another equal and opposite charge. There is developed (induced) in B equal and opposite charges. We may, therefore, state that *whenever there is developed a charge of electricity there also appears an equal and opposite charge*. A rain cloud with a positive charge approaching the surface of the earth, draws to the points of the earth nearest the cloud an equal negative charge.

An apparatus for holding or containing a charge of electricity is called a condenser. Thus a rain cloud becomes a large condenser. If bodies with opposite charges be brought near each other, but separated by a *dielectric*, they may be charged to a high potential. A dielectric is a substance that will not allow the electricity to pass. Dry air is a good dielectric or *insulator*. Glass is another. The Leyden jar, Fig. 5, is constructed by pasting tin foil on the



Fig. 5—Leyden Jar

inside and outside of a glass jar. Metallic connection is made from the inside foil to a brass knob above the lid of the jar. The inside and outside may receive opposite charges to a very high degree from an electric machine, so that the electric pressure or potential difference between them is very great. It is desired that a clear idea of the use of the word potential shall be obtained, as it will assist in understandings of electric currents.

A machine for obtaining differences of electric potential is shown in Fig. 6. Two circular plates of window glass placed with their surfaces about an eighth of an inch apart are made to revolve in opposite directions. Driving wheels below have the band from one wheel crossed. The glass discs are carefully coated with shellac

varnish, and on the outside of each of them there are cemented an equal number of radial sector-shaped plates of thin metal at equal distances apart. Metallic combs placed horizontally each side of the centre collect positive and negative charges and deliver them to the curved brass discharging rods that end in balls above the revolving plates. There is more detail that is not necessary to mention in a work of this kind. When the glass discs are made to revolve rapidly positive and negative charges of electricity are collected by the respective combs and pass through the collecting rods to the brass balls. If the balls be made to touch, a current passes. If they are drawn a few inches apart by the handles at the side the electricity will jump across the gap, with a loud snapping noise. As the air is a poor conductor, the potential difference between the balls may be very great. If the space between the balls be too great for the electricity to jump across there will be seen, especially if the room be darkened, a brush discharge of light from all points on the machine, something like the St. Elmo's light. Northern lights with different atmospheric conditions may be similar.

We have seen how electric energy may be developed on the surface of a body. If it has no easy means of escape, it is called static electricity. Some substances, however, conduct electricity readily, and are called *conductors*. The metals are included in this class. Substances that are poor conductors are called *partial conductors*, as the incandescent lamp film. Those that conduct very poorly are called *non-conductors* or *insulators*. In the latter class comes porcelain, gutta percha, shellac, oils, vulcanite, glass and dry air. In our therapeutic treatment we may use static electricity, as will be seen in a subsequent chapter. We have chiefly to do with *current* electricity in dentistry, that is, electricity in conductors and kept in control by partial conductors or by insulators.

The table below gives the relative conducting ability of some of the metals. When annealed, metals are better conductors than when hard drawn or tempered. Metals are not as good conductors when heated, that is, their resistance to the electric current decreases with rise of temperature:—

Silver	1.	Nickel	8.48
Copper	1.06	Lead	13.05
Gold	1.36	German silver	13.92
Aluminum	1.93	Platinum silver	16.21
Zinc	3.74	Platinoid	21.28
Platinum	6.02	Mercury	62.73
Iron	6.46		

Alloys of metals are not as good conductors as pure metals. Thus compare the conductivity of platinum silver containing one part platinum and two parts silver with the conductivity of pure platinum or silver. Or compare the conductivity of German silver with the conductivities of the copper (40 parts), nickel (32 parts),

zinc (25 parts), or iron (3 parts) contained in it, or platinoid (cu. 60, zn. 24, ni. 14, w. 2) with the conductivities of its constituent parts.

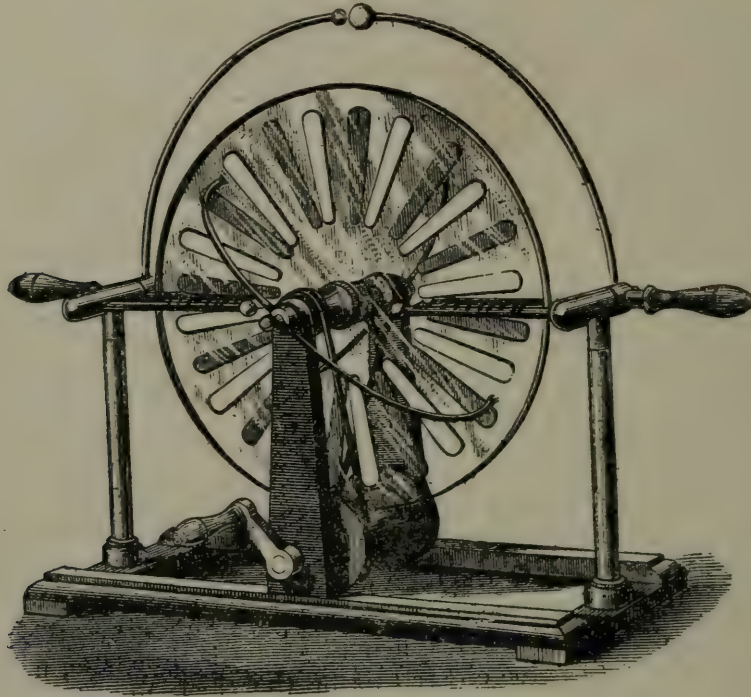


Fig. 6 - Static Machine

ALVEOLAR OSTEOCLASM AND GINGIVITIS.

ANDREW J. McDONAGH, D.D.S., TORONTO.

Mr. President and Gentlemen of the Fifth District Dental Society of the State of New York:

Usually of late years when starting a paper of this kind an apology is made for the title of the paper. It has been customary to use a word which only partially designated the subjects talked about, and therefore an apology was necessary. In this paper an endeavour will be made to use an expression which will be adequate to describe that about which we desire to talk. That expression perhaps, indeed probably, will be new to my hearers, because it has, so far as I know, only been used during my lectures in the Royal College of Dental Surgeons of Ontario, viz.: "Alveolar Osteoclast."

In looking over the skulls of prehistoric man, as well as of men of the present and immediately past times, and the skulls of a number of domesticated animals, we find that the ridge of bone which holds the teeth in place, the alveolar ridge, has been dissolved away at its highest point by some physiological process. We find also in some cases that it is dissolved away, making a sort of pocket, which extends down alongside of the roots of the tooth.

This latter condition is not so common as the former, but it does exist in different specimens, principally specimens of modern times: but not exclusively in modern specimens, because in the museum in New York there is at least one specimen of an ancient Esquimaux in which this peculiar condition obtains.

I said it was due to a physiological process. It would probably have been more correct to say that it was the result of pathological condition.

The alveolar tissue is peculiarly situated in man and beast, inasmuch as it contains the poorest protected joint in the animal system, the dento alveolar joint. Many learned essays have been written regarding the peculiarity of this joint and about the micro-organisms which abound in the fluid, existing in close proximity to it. In this paper we will not enter into a discussion of this part of the subject.

We are aware that in order to break down bone by the process of nature, nature has supplied a cell called the osteoclast, which has the power of producing a fluid capable of dissolving bony tissue. This cell acts through the influence of certain stimuli or irritations, for instance the erupting permanent tooth is a cause sufficient to induce the activity of this useful cell, and in that it is a benefit to the animal structure, and also in that it is performing a physiological function.

But there are agents which cause its activity other than those supplied by nature. For instance, an inflammatory process attacking the peridental membrane will cause the osteoclast to carry away part of the osseous tissue of the alveolus.

The clogging up of the blood supply of the alveolus, as in overworked athletes and people suffering from faulty metabolism, is also sufficient cause to stimulate the activities of this cell.

The osteoclast, when we refer to it as a living cell, is always engaged in this sort of work. It is true that the name osteoclast is also given to an instrument the function of which is to break bone. If we wish to restrict the uses to which we put the name Osteoclasm I presume we are at liberty to do so. We might say that Osteoclasm must only be used to designate the work done by the osteoclast, but in the study of the diseases of the alveolar bone we find that the osseous tissue is broken down by other forces than the activity of the osteoclast, therefore would it not be wise to use the word in a broader sense, not depending on a word already formed, but going back to the original source, namely, the Greek language. There we find Osteon, meaning bone, and Klan, to break, and deriving our word from these two, as iconoclasm is derived from Ikon and Klan, we get osteoclasm, meaning the destruction of bone.

“Alveolar Osteoclasm” meaning the breaking down or the destroying of the alveolar process. And when we take this phrase as our guidance you will find that it includes all the different

diseases which we have been designating by different titles, which are sometimes erroneously styled Riggs Disease.

Alveolar Osteoclasts is the direct result in the alveolus of pyorrhea alveolaris, phagadenic pericementitis, deposits from a rheumatic diathesis and traumatic injury (as injudicious ligating, etc.); also, indirectly, from faulty metabolism and auto-intoxication, mal-occlusion, impaired blood pressure (whether through nervous worry, toxins or any other cause), congenital anatomical peculiarities and rheumatic diathesis.

Looking at the disease from this standpoint, we can readily understand that there will be a standard of operation for the cure of the disease, because if that which we are to treat is the broken down or breaking down alveolar tissue, it stands to reason that our business is to stop the breaking down process, and as far as lies in our power to induce nature to repair the injury done. If the pathological condition which we meet with in the mouth is to be successfully treated we must have at least an idea of the cause of this condition. Indeed, if possible, we should have an absolute knowledge of the cause, and it is our duty to make as thorough an investigation as possible, and to satisfy ourselves as far as we can.

Some years ago there was a theory championed by some of the best men in the profession that this condition was caused by the patient having a rheumatic diathesis: that the disease was a direct result of this constitutional disorder, and the theory therefore was that only through constitutional remedies could we hope to have any success.

Other scientific minds in our profession who thought they were equally qualified to speak authoritatively insisted that the disease was entirely of a local character, due to local irritants, and had nothing to do with the constitution.

Then other investigators have asserted that the disease is the direct result of faulty metabolism and lack of assimilation. Others again claim that it is a micro-organic disease, the peculiar micro-organism always being very much in dispute.

The members of each set of investigators have tried with a great deal of force to prove their particular theory, and in that way have added a great and invaluable amount of information for use in the literature of the dental profession.

But they cannot all be right and all be wrong. The only reasonable conclusion one can come to is that there are more than one of them on the right path. The writer believes, as a matter of fact, that they have all been describing a condition that exists, a cause and a result which is a disease, but that each one has been describing but one particular phase of a disease, or rather one particular cause of a pathological condition, namely, the destruction of the alveolar process.

From my experience I would say that there is not the slightest doubt that the destruction of the dental alveolar joint through

a lime salt deposit lodging there is sometimes due to the condition known as rheumatic diathesis. But I would also say that this peculiar phase of the disease is the rarest which we meet.

In my practice, since I have been specializing, I have treated many thousand teeth, and of that number I do not believe there have been more than one hundred teeth affected which I could truthfully say was the result of rheumatic diathesis; but in a great many cases there has been every indication, every reason to make one believe that rheumatism was the result of the formation of pus around the roots of the teeth.

In this particular form of the disease the indications we have of its existence are similar to those we have of the existence of a dead septic pulp just beginning to form an abscess at the apex of the root. The tooth becomes sore to the touch and it feels to be a little longer than the other teeth. There is a swelling on the gum directly over a root of the tooth. There is this difference, however, the tooth, being alive, will respond to heat and cold; in fact it is sometimes hyper-sensitive, and if we drill into it, as we are sometimes tempted to do, it gives us all the indications of a living tooth.

To treat this form successfully we have to cut through the gum tissue and remove the deposit which has accumulated on the root of the tooth, and also remove the peridental membrane which has been destroyed and probably infected. Smooth off the edges of the broken alveolus, because it is usually not absorbed away in a regular line. Wash all the matter out of the sac which has been formed by the inflammatory process, and usually nature will do the rest without the necessity of packing.

Sometimes it is not as easy to perform this operation as it is to tell about it, because the deposit may be in such a position and the inflammatory process may have extended so far that the case is more complicated. In fact, sometimes it is necessary to devitalize the tooth, fill the roots, and amputate part of a root. I have spoken of this peculiar phase of the disease first and said all I am going to say about it, because it is so different, both in appearance and treatment, from all the other forms with which we have to deal.

Alveolar Osteoclastism, as we have seen, may be pathological or physiological. It may be very extensive, so much so that the whole of the alveolar ridge will disappear and the masticatory apparatus be disabled, and we as dentists have to deal with the causes of this destruction and as far as lies in our power prevent it.

We know that as long as the gum tissue and the peridental membrane are in a healthy condition the dental alveolar joint is sufficient to carry on the work for which it was designed, and therefore it is our endeavor to protect that particular joint. If the blood supply in the peridental membrane is good and the blood composing that supply is of the proper quality, the proper fluidity, having a high opsonic index, then there is no possibility

of micro-organisms obtaining an inroad at that particular point. Even the pressure of foreign material, such as tartar, is not sufficient in some mouths to cause an appreciable deterioration in the peridental membrane or the alveolar bone. Unfortunately, however, that is not always the case. Sometimes the pressure of salivary calculus on the gums will cause them to recede till the peridental membrane is exposed: the irritation on it through the mechanical pressure of the calculus, and the activity of the micro-organisms which the calculus contains, is sufficient irritation to result in the breaking down of the alveolar structure. But we may see many cases in which the alveolar structure has been destroyed but there has not been a deposit of salivary calculus, and, in fact, when the patient has made every effort to keep his mouth in a proper condition, and those cases we must account for in some other way. Dr. Talbot and many others account for it through faulty metabolism and auto-intoxication, and I believe that we cannot leave this factor out of consideration if we want to understand the reasons for pathological osteoclasm.

If the blood supply becomes clogged or loaded with toxins and cannot flow as freely as it normally should do, then the peridental membrane, which is in a very confined space, is immediately put at a disadvantage in its fight with the micro-organisms. In the fluids of the mouth, Dr. Talbot says in dealing with this question: "The toxic products circulating in the blood affect the heart and cause a high blood pressure. High blood pressure, together with toxic products circulating in the blood, set up an inflammation in the alveolar process and gingival border: the alveolar process first because in the gum tissue under high blood pressure, the tissues being soft, arteries can, and do, expand, and the tissue recovers as soon as the cause is removed. And because the arteries running tortuously through the bone cannot expand, blood pressure and toxic products cause inflammation and absorption of the bone without restoration." I do not believe with Dr. Talbot that the blood streams flowing through the canals in the alveolar process become stagnated, and on account of that, the process, which is a temporary, an end tissue, is dissolved away, excepting in rare cases, and in these rare cases the teeth do not loosen and fall out, but the whole structure containing the teeth seems to have lost its hardness and stability. It is true this is one form of Alveolar Osteoclasm, but not one we have to deal with very often.

It is a fact that when the peridental membrane is young it is very vascular in the majority of people, but as it grows older it becomes less vascular and the freedom of the blood flow becomes restricted. In such a case the micro-organisms have greater opportunity to cause a damage than when the flow of blood is unrestricted. Consequently we find that this disease is more prevalent in the old than in the young. When we find it in the young it is very often associated with arterio-sclerosis.

Dr. Black described a disease and called it phagadenic periementitis, in which the dental alveolar joint is destroyed, and of course the bone surrounding, but which is not associated with the discharging of pus. This is a form of the disease we quite often meet; probably it is as common as any other feature of the disease.

Dr. Black does not pretend to give us dogmatically a cause of this phase of the disease, but I believe if we read a paper by Dr. Timothy Leary, written in the *Cosmos*, January, 1909, we will have at least a plausible explanation not only of this phase of the disease, but also of several other phases of Alveolar Osteoclastism. Dr. Leary attributes to the fusiform bacillus a great deal of the pathological conditions which result in Alveolar Osteoclastism. He brings it to our notice that the fusiform bacillus is always an inhabitant of the mouth, that it flourishes as an anaerobic micro-organism, and that it is not of itself a pus-former.

That it is not always discovered in experiments and investigations is on account of the difficulty experienced in making cultures of it. Remembering those facts, we can easily see how, under favorable conditions, this micro-organism could cause the death of the peridental membrane, and, through it, the absorption of the alveolar bone without any great amount of pus resulting.

We can also see that when there are such numbers of different kinds of micro-organisms as there are in the mouth that a mixture of the fusiform bacillus and pus-forming micro-organisms is quite probable under certain conditions.

We have hurriedly gone over some of the principal theories regarding this disease, or, if you like, these different diseases, that is—the rheumatic theory, faulty metabolism theory, the micro-organic theory and the local irritant theory. We have simply taken them in review, and in reviewing them we see that they are all causes of the destruction of the alveolar process, namely, causes of alveolar osteoclastism.

If there are different theories as to the disease which we have to treat, then there are also a great many methods suggested by which to treat it.

One man says that by the simple mechanical removal of the calculus you will obtain a cure—and he has partial success. Another man says that it is absolutely necessary to treat the disease constitutionally—and he may or may not have partial success. Another man says that a vaccine is necessary to raise the opsonic index—and if he uses the proper vaccine he is sure to have temporary success at least. Another man says that by the application of a strong solvent of lime salts to the affected part you will succeed—and he claims to have partial success. But there must be some means by which he will have almost universal success, and if we look at the different causes which have been enumerated and try to evolve an intelligent method of combating the disease we should certainly be successful.

Then let us consider the conditions that we have to treat. In the first place, there is a local irritant which has to be removed. That irritant may be dead peri-dental membrane, dead particles of alveolar tissue, salivary calculus, or a serumal deposit, and these, mixed with micro-organisms or food and tissue debris, constitute the irritants which must be removed as the first step in the treatment. Then we must remember that the alveolar bone has been partly dissolved away, that part may be in place and attached quite firmly to the tooth root and be dead. We must also remember that the hard tissue which has been containing the pus is impregnated with the micro-organisms and their toxins, also the soft tissue surrounding the parts has been irritated by these septic materials, and the surface next to the pyorrhea pocket is in a very unhealthy condition. By means of scalers and files or planes, or whatever your favorite instrument is, and by whatever procedure suits you best, you mechanically remove the irritants, and in some cases where the disease has not existed for a length of time or has not made much headway, and particularly where it is the result of local irritant, you will get healing without paying any further attention to the case, but not always. It is very often necessary to use a solvent for the small particles of deposit that your instrument does not remove, to smooth off the bony tissue and dissolve the lime salts out of the mouths of the canaliculi of the roots, and you will need an agent to scarify the soft tissue sufficiently deep to get new and healthy granulations. This process I hope to demonstrate to you in my clinic.

If the teeth have become very loose and you consider that there is sufficient bone to hold them in place, if it were entirely healthy, then ligate the teeth together by a silk ligature. But if one or more of the teeth have become so loose and the bone appears so much destroyed that, even though healthy, it would not hold the teeth in place, then it is necessary to put on a permanent splint. That can be done without devitalizing the teeth or without having any of the gold show on the anterior side of the teeth. Drill a hole on the lingual side of the tooth large enough to take a twenty-gauge iridio-platinum wire. Drilling one hole in each tooth parallel to the pulp chamber, you can make inlay backs, which are attached to each other, to the iridio-platinum wire and cemented to the teeth.

Sometimes it is necessary to extract and replant a tooth, and in that case, speaking, of course, where it is done on account of being affected by this disease, it is always necessary to attach that replanted tooth by a permanent splint.

An advantage may be obtained in certain cases by cutting the gum tissue away from over the root to facilitate the operation of scaling the root, and very often teeth may be saved by so doing. But as it usually causes the gum to leave the neck of the

tooth very much exposed, we should only resort to this measure in extreme cases.

The question naturally arises, "Is it necessary to use constitutional treatments?" As a rule, no, because at the time the patient comes to us the disease is developed and it is its own immediate cause. The original cause, which may have been faulty metabolism or a disturbance of the blood pressure, through worry, nervous diseases, etc., has disappeared.

If, however, in your judgment the patient is still suffering from constitutional troubles it is only common-sense to see that constitutional treatment is resorted to to rectify the evil, but if your efforts at local treatment are thorough, in all probability you will have good healing, provided the constitution of the individual is anywhere near fairly good and the patient is willing to assist you by keeping the mouth in a clean condition and will visit you regularly for examination.

If we always keep in our minds that we have to deal with a suppurating wound in the mouth, that we must keep our instruments sterile to treat it, that it is human tissue governed by the laws of nature much the same as any other part of the body, we will have success with at least ninety per cent. of the cases we attempt to treat, providing always that we use sensible instruments and are adapted for the work.

Dominion Dental Journal

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Winnipeg

All Communications relating to the Business Department of the Journal must be addressed to the DOMINION DENTAL JOURNAL, 3 College Street, Toronto, Ontario.

VOL. XXIII

TORONTO, JULY 15, 1911

No. 7

CAN THE SCHOOL OF DENTISTRY OF THE R.C.D.S. REMAIN PERMANENTLY AS AT PRESENT CONSTITUTED.

A few years ago the Board of Directors of the Royal College of Dental Surgeons of Ontario looked into the matter of university connection for the school of dentistry. From the inquiry made by the Secretary at that time, it was clear that the tendency of all dental schools was to seek university connection. Since then many dental schools of this continent have become organized as integral parts of universities. The chief reasons for such connection are educational and financial. The business of a university is education. It has all the machinery for such work from a president to a janitor, whose whole time is devoted to education. The finances are assured, and as a consequence there is no necessity for grasping

at students' fees, starving the professorate, or giving a poor educational training.

It is becoming more clearly demonstrated each year that scientific courses in colleges are the most expensive. No student could afford to pay the necessary fees to cover the cost of equipment and teaching in such departments. Teaching dentistry is rapidly falling into this department. There are dental departments on this continent who have a salary budget for teaching alone of \$40,000 a year, where the attendance is not more than 200 students. Buildings, equipment and maintenance are an additional cost. Another example of what the cost of teaching dentistry is coming to is shown in the Evans bequest of one million and a quarter of dollars to establish a dental school in Philadelphia. The trustees of the fund found that this was not enough to establish and maintain such an institution as the teaching of modern dentistry demands, consequently they have united with the University of Pennsylvania, securing its staff, laboratories, equipment and financial assistance. These are not the only institutions that might be mentioned.

What does this all mean for Ontario where 800 dentists are conducting a dental school. Can the educational guidance of the voters at a board election be expected to be the best possible in dental education? It may have been so before dentistry was recognized as a profession, but it certainly is not to-day. No state university is so directed. The Provincial University of Ontario is not so organized.

It must be clear to anyone that the profession of Ontario cannot go on forever with its present financial support and give a dental education the equal of that obtained elsewhere. The profession must look for direct taxation for maintenance or outside aid. The reasonable thing is state assistance by becoming a part of the Provincial University

It may be argued that we have in the past given a good education, maintained the school and built a new building from the fees of the students. If this be true, the only conclusion is that the teaching staff have done a wonderful work of charity for dental education in this province. Times are changing. Teachers of dentistry, as well as teachers in other departments, must be paid commensurate with their calling, or they will not continue.

It is only a matter of a very short time until the University of Manitoba, a State supported institution, will establish a dental

department and give a dental course on the standards of the institutions so established. Both Laval and McGill are in fact so established, and just as soon as these heavily endowed institutions reach dentistry they will do what a private school cannot do.

Without delay our Board should bester itself to establish a closer state relation in dental education. It is not the part of wisdom to wait for five or ten years until the institution cannot be maintained at the highest possible standard on the student's fees. This province cannot afford to allow a better dental education to be given in any other province or state. At some later time we propose to go into this matter more fully.

Editorial Notes

Dr. French, of Renfrew, has sold his practice to Dr. Downing.

1,195 children have had teeth filled in Toronto as a result of dental inspection.

Mrs. Schumaker, of Windsor, Ont., died recently from the effects of an infected tooth.

It is said that just five minutes of the school day in Cleveland is to be spent in brushing the teeth.

Dr. W. P. Power, of Toronto, has taken over the practice of Dr. W. H. Marrs, of Port Elgin, Ont.

\$20,000 has been voted by the State Dental Society of New York for a dental educational campaign.

The Dentists of Orillia, Ont., will close their offices on Thursday afternoons during the summer months.

Drs. Holmes, MacSween and Hacking, of New Westminster, have moved their offices to the Cleff block.

The Vermillion Standard, Alta., has for a year or more published many interesting articles on dentistry.

Dr. Harvey Robb has decided to give up the practice of dentistry and devote his whole time to music.

The Dentists of Woodstock, Ont., will close their offices on Friday afternoons during June, July and August.

The Nova Scotia Dental Association met at New Glasgow, July 13 and 14, and the New Brunswick Association met in St. John, July 11 and 12.

Dr. A. T. Watson, Leamington, Ontario, died at St. Joseph's Hospital, London, after a brief illness, subsequent to a surgical operation.

According to the daily press of Toronto, Dr. J. S. Island has disposed of his method of recovering precious metals from re-

fractory ores for the fabulous sum of ten million dollars.

The Kingston Standard advocates lectures by physicians on physiology and hygiene to teachers in training. Very good, but physicians know little and care little about mouth conditions.

Dr. Quirk, of Calgary, thinks he should recover artificial teeth stolen from a show case. Other dentists no doubt think the theft should tend to show him it is not in good taste to so advertise.

Dr. Doherty, Dental Inspector of the Public Schools of Toronto, delivered an address to the teachers in training at the Ontario Agricultural College, Guelph, on the importance of the care of the teeth of children.

Will dentists as a body make an effort to correct the press in the name of their dental office. It is not a parlor. Who would think of doing surgery in a parlor. It is a humbug to try to make people believe that the pleasures found in a dental office are the same as those found in a parlor.

FOR SALE.

Dental practice for sale in town of fifteen thousand. Giving up practice. Full particulars by addressing Box 25, Dominion Dental Journal.

FOR SALE.

A \$2,000 practice, office entirely furnished, rent \$6 a month, no opposition. Price with outfit \$75. Would sell outfit separately. Apply Box 5, Dominion Dental Journal, 3 College St., Toronto.

FOR SALE.

A Dental Practice for sale in city of twenty thousand, at a very moderate figure. Reason for selling, ill health. Apply Box 2, Dominion Dental Journal, 3 College St., Toronto, Ont.

Proceedings of Dental Societies

DENTISTS IN ATTENDANCE AT THE ONTARIO DENTAL SOCIETY MEETING.

Frank E. Bennett, St. Thomas; W. A. Dalrymple, Toronto; O. C. Watson, Campbellford; B. F. Nott, North Bay; R. E. Stewart, Elmira; N. Carmichael, Toronto; V. E. Hart, Lindsay; J. F. Simpson, Trenton; C. L. Hawley, Trenton; G. G. Roberts, Brampton; C. A. Corrigan, Toronto; R. S. Hamilton, Brussels; J. N. Dunning, Wallaceburg; C. N. Simpson, Port Arthur; H. M. Kalbfleisch, Elmira; W. R. Greene, Ottawa; H. R. Kinsman, Exeter; M. L. Laidlaw, Toronto; J. B. Carmichael, Toronto; J. A. C. Hogan, Hamilton; A. M. Weldon, Beaverton; W. Allan Armstrong, Ottawa; W. R. Rodger, Toronto; J. C. A. Crawford, Haileybury; R. E. Fisher, Toronto; M. P. Corrigan, Strathroy; J. J. Wilson, Burks Falls; J. R. McGregor, Elora; J. B. Wilmott, Toronto; W. E. Wilmott, Toronto; J. A. Bothwell, Toronto; R. J. Reade, Toronto; J. H. Irwin, Collingwood; C. H. Juvet, Ottawa; W. H. Doherty, Toronto; A. J. Broughton, Toronto; D. L. Brown; W. T. Haynes, Toronto; H. A. Semple, Toronto; W. C. Gowan, Peterboro; A. J. McDonagh, Toronto; D. A. Clark, Hamilton; W. A. Black, Toronto; R. G. McLaughlin, Toronto; A. W. Thornton, Toronto; W. R. Somerville, Haileybury; W. A. Mathison, Port Rowan; W. G. Price, Toronto; Geo. S. Martin, Sudbury; I. J. Wigle, Hamilton; A. A. Smith, Cornwall; W. B. Cavanagh, Cornwall; M. A. Ross, Thomas, London; B. F. Huffman, Forest; Wallace Seccombe, Toronto; W. J. Woods, Toronto; G. H. Campbell, Orangeville; R. Sidney Woollatt, Toronto; J. P. McLachlan, Toronto; J. Baiken, student; E. R. McKay, student; J. H. Hockin, student; F. R. Davis, student; J. A. Allin, student; F. P. Shaw, student; J. M. Dixon, student; W. G. Manning, student; C. R. Minns, student; Mr. Haynes, student; R. C. H. Staples, student; L. E. Tanner, student; G. I. Robertson, student; J. G. Sommerville, Niagara Falls; G. A. Bent-

ly, London; W. S. Westland, London; W. McGuire, Waterford; J. A. Fleming, Prescott; Geo. N. Howden, Waterford; T. A. Routledge, Ridgetown; E. F. McGregor, student; J. N. Stewart, Hamilton; M. D. Gordon, Toronto; A. W. Muir, Fergus; G. E. McGuire, Dunnville; G. E. Hill, Toronto; E. A. Dolson, Toronto; H. E. Klinger, Toronto; R. M. MacFarlane, Berlin; E. C. Veitch, Toronto; F. W. Landymore, student; A. J. Steele, Toronto; E. M. Fulton, Hamilton; H. W. Wilkinson, St. Mary's; G. S. Bonnycastle, Bowmanville; C. H. Waldron, Toronto; A. E. Santo, London; W. Revell, Windsor; H. Wightman, Peterboro; H. A. Hoskin, Toronto; Geo. Hicks, Watford; Harold Clarke, Toronto; P. P. Ballachey, Brantford; H. M. Richardson, Toronto; W. T. Willard, Toronto; G. W. Everett, Hamilton; W. Windyer, Exhibit; F. C. Husband, Toronto; M. W. Rutherford, Toronto; H. P. Temple, Exhibit; F. W. Fisher, Exhibit; W. M. McTavish, Exhibit; J. C. Devitt, Bowmanville; Ed. Paul, Toronto; Mr. Reynolds, student; C. A. Snell, Essex; H. N. Hartman, Meaford; C. H. Clarkson, Toronto; H. S. Reynolds, Picton; J. J. Loftus, Toronto; W. C. Trotter, Toronto; Arthur Day, Toronto; A. E. Webster, Toronto; A. R. Robertson, Ayr; G. G. Hume, Toronto; J. A. Slade, Toronto; F. N. Badgley, Toronto; F. D. Price, Toronto; T. N. McGill, Toronto; J. A. Thompson, Havelock; W. M. Wunder, Toronto; G. G. Jordan, Toronto; J. M. Cation, Toronto; A. A. Hicks, Chatham; F. L. Fossume, New York; H. A. Clark, Brockville; T. J. Howe, Toronto; W. W. Thornton, Dresden; A. W. Ellis, Toronto; G. W. Grieve, Toronto; C. L. Daly, Toronto; F. R. Mallory, Toronto; J. S. Chambers, Toronto; A. D. A. Mason, Toronto; A. H. Mabee, Gananoque; A. V. Summers, New Liskeard; F. G. Hendry, Delhi; F. T. Coghlan, Guelph; S. Gowan, Brockville; Chas. E. Pearson, Toronto; H. J. M. Ban-

nerman, Owen Sound; L. G. Campbell, Markdale; E. A. Grant, Toronto; S. L. Frawley, Toronto; W. C. Smith, Welland; H. E. Eaton, Toronto; J. W. Leighton, Exhibit; E. F. Arnold, Toronto; H. F. Kinsman, Sarnia; J. M. Deans, Galt; J. J. Brown, Woodstock; J. L. Sutton, Lindsay; G. P. Allen, Mount Forest; Chas. A. Terry, Huntsville; Ernest McDonald, Galt; J. W. Barker, Cannington; J. J. Kerr, Cobourg; Carl E. Klotz, St. Catharines; O. S. Clappison, Hamilton; O. W. Daly, Kingston; S. H. Simpson, Kingston; F. Hansel, Hamilton; J. F. O'Flynn, St. Catharines; R. J. McGahey, Toronto; E. Hart, Brantford; R. Walker, Bolton; J. A. McArthur, Markdale; M. A. Hanna, Ottawa; H. A. Nesbitt, Lindsay; G. T. Kennedy, St. Thomas; W. Burnett, Galt; A. E. Rudell, Berlin; J. A. Hilliard, Berlin; W. T. Holloway, Peterboro; C. P. Dorland, Oakville; T. F. Campbell, Galt; E. A. Hill, Sudbury; E. M. Ely, Ottawa; F. G. Law, Toronto; C. F. Walt, Sterling; L. E. Stanley, Ottawa; O. K. Gibson, Ottawa; F. A. Sellery, Hensall; A. V. Lester, Hamilton; C. E. Brooks, Toronto; S. Lederman, Berlin; P. T. Cobeland, St. Mary's; J. H. Carrique, Toronto; F. C. Vanduzer, Toronto; G. F. Gilroy, Toronto; A. A. Smith, Toronto; W. N. Sudworth, Ingersoll; Ghent Wilson, Toronto; G. M. Trewin,

Oshawa; W. H. Bowles, Orangeville; D. J. Bagshaw, Toronto; W. J. Hill, Alliston; V. L. Heath, Woodstock; F. L. Folllick, St. Marys; A. E. Cumming, Thornbury; Chas. E. Scott, Toronto; H. A. Robertson, Hamilton; F. L. Williamson, Hamilton; W. A. Burns, St. Thomas; J. M. Abbott, Erin; W. E. Wray, Toronto; E. C. Jones, Hamilton; F. G. Brethour, Toronto; W. J. Trelford, student; A. J. Johnstone, Petrolia; J. A. Beatty, Stratford; W. E. Cummer, Toronto; G. H. Kennedy, London; J. H. Purdy, Cobourg; Oliver Leslie, Perth; W. J. LaFlamme, Toronto; D. H. Dow, Dutton; C. J. Freeman, Beamsville; C. W. Ellis, Bradford; J. B. Ellis, Lethbridge, Alta.; J. F. Grant, Durham; E. L. Gausby, Toronto; B. E. Brownlee, Mount Forest; F. S. Loucks, Clarksburg; M. L. Moore, student; A. G. Campbell, Wallaceburg; F. C. Moore, Orillia; R. Meek, Orangeville; G. H. Ross, Brussels; J. P. Marshall, Toronto; J. W. B. Topp, Bracebridge; C. W. Bowler, St. Clair, Mich.; J. W. Coram, Toronto; C. W. Brown, Toronto; T. W. Davison, Owen Sound; G. Reid, Fergus; T. A. Currie, Toronto; T. E. C. Butler, Toronto; O. A. Winter, Toronto; E. S. Barker, Stouffville; Stanley Burns, Montreal, Que.; J. F. Ross, Toronto; W. W. Mills, Toronto; O. H. Ziegler, Toronto; C. A. Kennedy, Toronto.

NATIONAL DENTAL ASSOCIATION, CLEVELAND, JULY 25-28, 1911.

Program.—A complete literary program and approximately 300 Clinics assured. Probably the largest dental dealers' exhibit ever assembled.

The first session will open promptly at 11 o'clock Tuesday morning. Do not fail to be present at this interesting session. There will be morning, afternoon and evening sessions.

Clinics—Thursday and Friday mornings.

Lake ride and Cleveland entertainment Friday afternoon, and **Oral Hygiene Conference** Friday evening.

Special extra entertainment for the ladies during the meeting hour. Entertainment for Saturday, and a **Lake Excursion to Niagara Falls** for Saturday night and Sunday. Those desiring to remain for Sat-

urday and Sunday entertainment are requested to write the Local Committee of Arrangements for information.

Railroad Rates :—A fare and a half granted by most of the Passenger Associations. Demand a **Convention Certificate** from the ticket agent, whether you wish to use it or not, and present it to the **Information Bureau**.

Hotels :—Write the hotel of your choice for reservation. Do not fail to state the time you will arrive, the accommodations desired and the price. (See **June Dental Journals**.)

Membership :—Any member of a State Dental Association is eligible for membership upon certificate signed by the President and Secretary of his society, and pay-

ing the fee of \$5. Any reputable dentist, and his lady, will be welcome as a guest upon registering and receiving a guest badge. No fee.

For information address—Local Committee of Arrangements, National Dental Association, 718 Schofield Bldg., Cleveland, Ohio.

PRACTITIONERS' COURSE, AUGUST 29TH TO SEPTEMBER 9TH.

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

The Board of Directors have arranged for a Practitioners' Course on above dates, in the College building.

This course will be a practical one, and the tuition will be free to all licentiates in Ontario whose annual fees are paid. To all others the fee will be \$20.00.

Toronto Exhibition railway rates of single fare will be available.

General lecture at 8.30 a.m. daily.

Laboratory Sessions 9.30 to 12.30 and 2 to 5.30 each day.

Luncheon may be obtained in the College to be followed by an address from some prominent citizen every day.

Further information and a list of instruments necessary will be sent you shortly.

Mark off these dates on your appointment book.

Obituary

DR. A. T. WATSON

Dr. A. T. Watson, of Leamington, died after an operation in the London General Hospital, May 21, 1911.

The remains were buried in Brantford, the old home of the deceased.

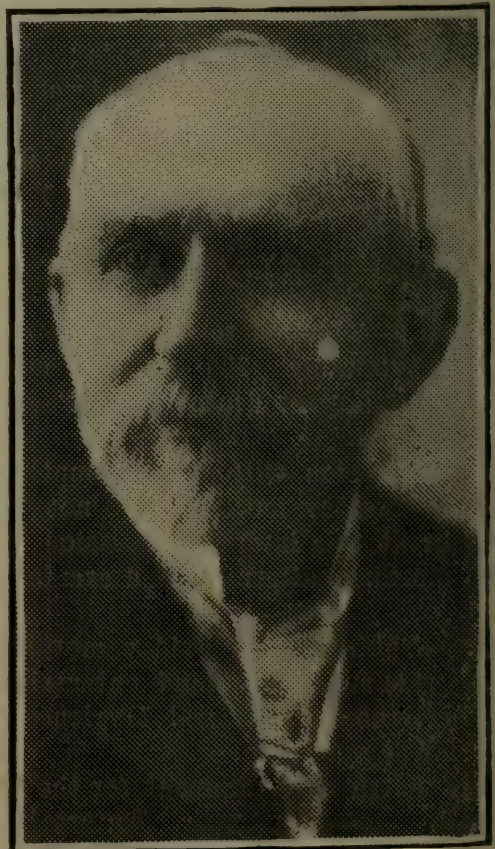
Dr. Watson was born in the Township of Boulton, York County, and, like most of our professional men, spent his boyhood days on the farm. He taught school for some years and then graduated in dentistry in the Universities of Toronto and Philadelphia. He practiced his profession in Brantford and different cities in the west, and about nine years ago located in Leamington. About two years ago he sold his practice to Dr. Sloane.

He was a member of the Presbyterian church, and a staunch Conservative in politics.

In English literature he was almost an authority, and his tastes were classical and refined. An inexhaustible collection of the richest gems of the English poets was stored in his memory, which lost none of their beauty and meaning when rendered by him.

Besides his sorrowing widow he leaves two brothers and two sisters, to all of

whom is extended the heartfelt sympathy of the whole town.



DR. A. T. WATSON

EDUCATIONAL COMMITTEE OF THE TORONTO DENTAL SOCIETY 1911-12.

Chairman—Dr. R. G. McLaughlin.

Secretary—Dr. J. A. Bothwell.

Treasurer—Dr. A. E. Webster.

The Toronto committee consists of the following members:—Drs. Conboy, Secombe, Kennedy, A. E. Webster, A. D. A. Mason, Bothwell, Reade, McGill, Eaton, McLaughlin and Doherty.

NATURE'S TOOTHBRUSH.

The West Indians Chew a Stalk Which Serves Most Effectively.

"Tourists never fail to notice the remarkably white teeth possessed by the natives of the West Indies," said the Cuban. "Nature provides a ready-made tooth brush for the West Indian, which is used by rich and poor alike, and which has the advantage of being absolutely sanitary:

"You see, there is a species of withe, or creeper, to be found in the islands, which has unusual cleansing properties. If one chews upon a section of the stalk the sap froths up and forms an abundant lather, which removes all impurities from the teeth and gives them the whiteness of polished ivory. It has a somewhat bitter but not unpleasant flavor. The natives learn to use it when they are children, and continue to chew it all their lives. One frequently sees a whole family, among the poorer classes, sitting outside their hut in the early morning, cleaning their teeth in this primitive but effective manner. They never need to use a 'brush' twice; but have a large supply on hand, as the stalks improve by being kept a few days and allowed to dry out. The withe was known to Caribs when Col-

umbus discovered the West Indies. It was also used by the Aztecs of Mexico. Both Spanish and Indian names correspond to 'chewing-stick,' and as a combination of brush, tooth-paste and jaw exerciser, it beats any patent device I ever have seen."

THE VULCANITE PLATE.

Plaster of Paris is the most reliable material for impressions, and it should be used at a consistency which will not press any soft tissue out of place. In mouths of unequal density, the impression should be relieved on high, hard spots, or the plate will rock. When the model is made, it should be trimmed neatly and evenly and handled carefully to preserve its surface. No good work ever comes from rough, battered models, or from the workman who is ankle and elbow deep in plaster. It might be said that the first requirement for good work is a clean laboratory.—Mark G. M'Elhinney, D.D.S., The Dental Review.

FOR SALE.

Practice in a live growing town. Inventory about \$1,800. Electrical equipment and modern throughout. Business for 1910 over \$4,300. Address Box 50, Dominion Dental Journal, 3 College St., Toronto.

FOR SALE.

Dental practice for sale in progressive southern Ontario city—population 16,000. Splendid chance. Office well appointed and beautifully located—price almost at invoice. Health has failed and must get away. Address all communications to DR. C. FITSIMONS, 557 Talbot St., St. Thomas, Ontario.

This is a cut of the

New Model Double Bowl

CLARK SPITTOON



Out of 800 Dental Salesmen in this country 799 know this is the very best spittoon made. The other fellow hasn't wakened up yet.

Buy from your Dealer.

A. C. CLARK & COMPANY
CHICAGO

Dominion Dental Journal

VOL. XXIII

TORONTO, AUGUST 15, 1911.

No. 8

Original Communications

THE MARITIME DENTAL COLLEGE.

FRANK WOODBURY, D.D.S., DEAN.

Read before the Nova Scotia Dental Convention, July 14th, 1911.

Gentlemen:

In making some comments respecting the work of your College at Halifax I want to point out at the beginning some of the advantages obtained by the profession of dentistry throughout the East. It must be a matter of pride to you to be able to point to an institution which in three short years, indeed before a class has been graduated, has come to be recognized among the better class and worthy dental college.

Many of our medical men, as our Calendar has come into their hands, have expressed surprise at the course of dental education which embraces so much and is so well calculated to make broad-minded, well-trained men. This is not strange, since in our part of the country they had not come in direct touch with any institution of learning of this kind. The College has thus been a very strong factor in raising our profession in the eyes of the medical profession.

Every dentist in the Maritime Provinces should see to it that our Calendar is well distributed to the medical men, to the principals of our schools and to our young people who are likely to study our profession. It is to the interest of every dentist in the Maritime Provinces to speak a good word for our own institution and to point out the high standards that the Canadian colleges have set. This is your College. There is but one other owned and conducted by the dental profession, viz., the Royal College of Dental Surgeons of Ontario. Anyone there will tell you that its presence in the Province and the fact that every man has an interest in it has been a lever exerting a constant pressure upward until Ontario stands at the very top in dental surgery to-day.

We owe it to our young people to establish and maintain a College in Eastern Canada. We are all probably graduates of foreign Colleges, but that is not our fault. There was no other course for us to pursue, but when we as Canadians see our ability to conduct an institution of the calibre of the M. D. C. and find a suitable building and a large part of the materials ready made to our hand, it surely is only a question of going about it. The rest of Canada expects us to go forward and care for the dental education of the Maritime Provinces. The Royal College, of Toronto, has been circularizing the high schools of the Dominion for probable students, but they notified us that they expected the M. D. C. to care for the East. We will surely accept the challenge.

Dalhousie University and the Halifax Medical College maintain their interest during the year. The Halifax Medical College has now become an integral part of the University, and is now known as the Faculty of Medicine off Dalhousie University. The same arrangements respecting laboratory and lecture privileges will be continued as before. There will be a distinct advantage to our own institution and draw us still more closely together. The new legislation passed last winter has placed our educational work on a practical basis. It is not the time to discuss our dental law in a general way, but as it relates to the work of the College. The dental profession of Nova Scotia finds itself in a most desirable position. The Association and Board have control of all registration, regulation and educational requirements for those who hereafter desire to practise in Nova Scotia.

MATRICULATION.

A new standard of matriculation has been formulated and approved by the Governor and Council, which is identical with the medical preliminary requirements. It is accepted by the University for matriculation, and has been formally endorsed by the Dominion Dental Council, so that henceforth the matriculants of the Provincial Dental Board will suffer no handicap.

PROFESSIONAL EXAMINATIONS.

The course of study in the Maritime Dental College coincides exactly with the requirements of the Board under the new law. The Dental Board has appointed the Faculty of Dentistry of Dalhousie as examiners of candidates for registration to practise. These examinations take place at the same time as those of the Medical Board and the Medical and Dental Faculties of the University, viz., in the spring and autumn. It should be noted in this connection that under our Act graduates of the M. D. C. are not required to take an extra professional examination to become registered in Nova Scotia.

APARTMENTS.

Our apartments in the University Building will accommodate us

for the present. A large room was last year added to our suite. The new Science Building will be proceeded with at once. After its completion there will be no lack of room in the present building for the Dental College.

CURRICULUM.

The curriculum of study finds few critics except among those students who desire to win a degree without study. We do not intend to present any student to the University for examination who has not earned the right by careful application to his work. The course is under constant consideration by the Faculty in order that from the abundance of material at our hand in the affiliated institutions we may select that which will make well balanced, educated dental surgeons.

INFIRMARY.

Many have been nervous, fearing that our Infirmary would not be equal to the demand of our student body. No one need worry. Last year we could not accommodate the patients who came to us. We have recently completed an arrangement with the naval authorities at Ottawa whereby the sailors and recruits for the station in Halifax will receive their dental service from the Dental College. This is a very desirable clientele from many standpoints and will supply a large number of patients.

LABORATORIES.

The scientific laboratories and practical anatomy rooms of the University are being much improved and important equipment is being added. The Nova Scotia Government is about to build a commodious and well-equipped pathological and bacteriological laboratory on the grounds of the Victoria General Hospital, which will probably be completed this year.

The head of this Government department will be professor of these subjects on our staff. We have arranged for increased accommodation for prosthetic laboratories. They are equipped with the usual appliances. The crown, bridge and porcelain room contains modern casting machines and the latest type of electric furnace and pyrometer, with facilities for electric connection for students' furnaces, etc.

DEMONSTRATORS.

As may be seen by reference to our Calendar, no infirmary could be more efficiently manned with demonstrators than ours. The student is under the guidance of experienced men all the time.

TEACHING STAFF.

They are all experienced and some are eminent men in their profession. Those in charge of the dental subjects are in real earnest, putting time, energy, thought and purpose into their work. They display an interest in the institution that spells success. The

men in charge of our dental chairs and lectureships are giving of their best.

ATTENDANCE.

It is impossible to tell how large our freshman class will be, but indications seem to show an increase upon last year. The profession has large powers to give us a good number of students. Let it be known that only graduates of Canadian colleges can take the D. D. C. examinations.

I take it that you are not conducting this College to overcrowd Nova Scotia, but to provide means whereby Maritime men may have a fair chance to go into Western Canada and take their places in the towns that are springing up over that vast territory. The M. D. C. can prepare these men. Send them to us.

PRACTICAL METHODS IN ORTHODONTIA, SHORT OF IDEAL FOR THE GENERAL PRACTITIONER.

BY W. J. HILL, D.D.S., ALLISTON, ONT.

Read before the Ontario Dental Socie'y, Toronto, May 31 June 1 and 2, 1911.

Mr. President, Ladies and Gentlemen:

This short paper is written, not for the specialist in Orthodontia but for the general practitioner, and especially for the general practitioner in small towns and places where consultation with the specialist is not convenient, and that idea must be kept in view by those listening to it. Also it does not treat of special cases but of generalities.

It is an unfortunate fact that many dentists avoid this work when possible, and the result is that many deformed mouths, that might present a more pleasing appearance, not to mention the hygienic condition, are allowed to go uncorrected until too late. Too often when the little patient with a more or less irregular denture is brought to the family dentist by an anxious parent they are told "to wait until all the teeth are in place and something can be done," or, "that nature will correct the irregularity in time," and so it is gotten rid of for the time, or perhaps, if the erupting permanent teeth are crowded, he extracts the adjoining temporary tooth or teeth to make room, and the resulting condition is eventually worse than the first.

Orthodontia as practised by the general practitioner must, of necessity vary from that of the specialist. The specialist sees only those coming to him for this special work, and devotes all his time to it. He looks for ideal results, and works with that end in view. If the work requires one month or six it is immaterial so long as the finished result is ideal. He is not satisfied with correcting the deformity in part, and allowing nature to do her part, but prefers

to turn out the finished operation if possible. Then, too, his patients are generally from the wealthier classes and the fees are in accordance with the time spent.

The general practitioner, on the other hand, has a great many demands on his time, and cannot give to his patients requiring orthodontia the amount of time the specialist can, but he can and must do a certain amount of this work, if he wishes to do the best for his patients, and for himself. I find a good rule is to take on but one case at a time, unless something urgent requires immediate attention.

He is the one who should first notice the trouble, and first give advice. If the case is complicated and he does not wish to undertake it, then he should advise them to go to a specialist. But sometimes their circumstances and finances will not permit it, and it is up to him to make good. There are patients for both specialist and general practitioner, and if we all do our duty the poor man's child is not deprived of all the benefits that go to the rich man's, and is not handicapped by a deformed mouth and face, of which many in this twentieth century are very conscious, also it gives them a chance for a better denture and a healthier mouth.

In general practice the dentist is in touch with a great majority of the patients from the time, and often before, the temporary teeth need any attention, but during the time of their replacement the child should be seen regularly, and, if necessary, a little help given to the permanent teeth to get them in proper alignment. It will frequently prevent prolonged operations later. Unfortunately some parents do not have their children visit the dentist regularly, and frequently the trouble has reached an advanced stage before being noticed.

One of the most common irregularities noticed at an early age is the inlocking of upper centrals or laterals, frequently due to the retaining of the temporary teeth too long. The case should be undertaken as soon as possible after being seen, and the tooth or teeth moved into proper alignment. This movement may be effected in a variety of ways. A Jackscrew may be used, having one end attached to the permanent molar and the other to the lingual side of the tooth to be moved; or a spring of German silver wire may be used, having one end attached to the molar and the curved end fitting under a lug on lingual side of tooth to be moved; or an alignment wire may be put on and, by means of rubber bands or wire attachments, draw the inlocked tooth or teeth to place, and once the tooth or teeth are moved so as to bite outside the lowers the trouble is at an end. The alignment wire, being outside the arch, is less, cumbersome to the patient, and in cases where two or more teeth are moved and requiring some time for correction is perhaps preferable. It is also useful where centrals or laterals overlap. A collar with tube soldered to it can be cemented to overlapping tooth

and, with the aid of a spring held by alignment wire, rotated into place.

Sometimes a patient of fifteen or older consults the dentist for the first time, and we find a superior cuspid has crowded a lateral entirely within the arch. At this age I extract the lateral and trim the sharp point of cuspid, in preference to the prolonged operation of moving the lateral into proper alignment, and claim the result justifies the extraction.

Frequently the lower incisors are badly crowded, while the upper ones are in proper place and the posterior teeth in normal occlusion. The extraction of one of the crowded lowers will frequently relieve the trouble.

In cases of crowded arches, often when the cuspids come to erupt there is not room for them and they erupt either inside the arch or high up on the outside. The ideal method would be to make room for them by expanding the arch, but frequently good results can be secured by extracting the first bicuspid, which will relieve the trouble when the cuspid is erupting on the buccal side by giving the needed room without deforming the face, and in many cases will insure a better dentition than a crowded arch.

If the cuspid is erupting inside the arch, I have got good results by swaging a small gold cap to cover the portion erupted and soldering a lug to it to hold a rubber band which is attached to a bar extending from the central incisor to the first molar and retained by bands of those teeth. The first bicuspid having been extracted, the cuspid is drawn out to place as it grows down.

The extraction of the first molar is condemned by the orthodontist, and rightly so, as no other tooth plays so important a part in normal occlusion, but sometimes a child of eight or nine is brought to us with this tooth in so decayed and such an unhealthy condition that it is a problem to know what to do with it. The parents say "they thought it was a temporary tooth and would be replaced." If the arch is crowded, then better extract it, and let the second molar take its place, but if the child is older and the second molar is already in place it had better be retained if possible, and if necessary to make room, remove first or second bicuspid, depending on their condition.

The most difficult cases are those of superior or inferior protrusion, and they should be undertaken as early as possible. The expansion of the arch by a Jackscrew or spring, and, if necessary, the extraction of a first bicuspid on either side to allow the cuspids to drop back as they erupt, removes the deformity to a great extent.

I have found the alignment wire and rubber bands cut from good rubber tubing, also springs of German silver wire, the most useful of all appliances, as the action is constant. All appliances should be cemented to place and under the control of the dentist in order to get good results. The majority of my patients for orthodontia are between seven and fourteen years of age, and once a case

is begun I arrange to see them every day until the retainer is put on. The retainer will depend on the case, but generally small platinum bands, fitting the tooth, or teeth, moved and the adjoining ones soldered together will be found all that is necessary.

The methods advocated here and the conclusions arrived at are the result of clinical experience in every case, and it has been a great satisfaction to note the results obtained and in many cases contrasting them with the original condition and what the result would have been had nothing been done.

Now, Mr. President and Fellow-practitioners, I am well aware that I have advocated some methods that are not in accordance with the principles of Orthodontia as laid down by the specialist, but I am speaking from the standpoint of the general practitioner and with the view to doing the greatest good to the greatest number and putting within the reach of all, no matter what condition their purse, the possibility of having a fairly regular denture and a more hygienic mouth. The work is interesting and anyone undertaking it, especially with children, will find it a pleasing variation to the routine of general practice. For reading and reference, I have found Jackson's work on Orthodontia a great help. His cuts of cases and appliances are very useful.

DISCUSSION.

DR. JUVET.—Mr. President, Ladies and Gentlemen: We have all listened with interest to the paper so ably prepared and presented by the essayist, and, while I fail to see how I can do the essayist justice, I will do the best I can, and hope that where I am lacking it will be more than made up by those following me in the discussion of so important a subject.

I should judge from the paper that Dr. Hill's aim is to stimulate a greater interest in the department of orthodontia among the general practitioners of dentistry, and he is to be congratulated in the efforts he has put forth in that direction in the preparation of his paper for your consideration.

It has always appeared to me to be a lamentable fact that there was so little interest manifested in this particular branch of dentistry by the general practitioner. Every dentist should familiarize himself in the diagnosis of cases of irregularities, and if he is competent to diagnose a case correctly he is then in a position to know how much irregularity there is presented and whether it would be advisable for him to treat the case himself or refer it to a specialist.

I think one of the main causes of indifference on the part of the general practitioner is due to his inability to properly diagnose a case, and he attempts cases that he should never have undertaken and then, through failure, refuses to undertake other cases that would be simple and possible for him to correct. I think most failures on the part of the general practitioner is due to error in diagnosis.

Cases which present, often appear simple of correction, but when models are obtained and the teeth and associate parts are studied, we find that the difficulties are much greater than we had at first anticipated. If there was more interest manifested by the general practitioner it would be of great assistance to the specialist, as oftentimes patients living outside of large centres could be treated by a specialist and dismissed to the tender mercies of the patient's own practitioner to watch over the case and follow the instructions given by the specialist, thereby removing the necessity of keeping the patient in a large centre under heavy expense.

I had a case sent me some time ago, and after preparing the appliance necessary to correct the irregularity, I sent the appliance clamped in position on the model, with instructions of how to treat the case, which was a simple one. The appliance was so constructed all that was necessary to do was to cement it in place and simply allow it to remain without any change until the desired result was obtained. You can appreciate my feelings when the appliance was returned with the information that the dentist was unable to put it on. In this particular instance it would have saved the patient's parents the expense of bringing the child a long distance, to Ottawa, for treatment.

With reference to Dr. Hill's methods of correcting irregularities by means of extraction as a means of saving the time necessary to bring about ideal results by means of expansion. From my experience in Orthodontia there are no short cuts, and there should not be any made where ideal results are sacrificed. How we ought to rejoice that there is something close at hand that is big enough to test, but not big enough to berak us.

I am very much opposed to the extraction of any teeth for correction of irregularities, and fail to see how the irregularity is corrected by that means.

DELETERIOUS EFFECTS OF EXTRACTION.

I can truthfully say that by extraction performed in order to prevent nervous strain during orthodontia treatment, or to prevent protruding lips, we in reality are starting the patient on his or her journey through life inadequately prepared to meet the demands upon his strength. We are inviting nervous breakdown because such persons are the victims of an inefficient masticating apparatus and usually lack normal breathing. The facial lines, too, are badly mutilated by extraction; this may not be apparent at first, but as soon as maturity is reached, the lack of development of the dental arches becomes painfully apparent. There are thousands of men and women all around us with weak lips and faces, due either to lack of treatment or to the extraction of one or more teeth, performed in a futile attempt at the correction of malocclusion. I think the condition is invariably made worse when extraction is resorted to, as with the arches normally developed and normally proportioned

forming as they do the base of the nose, we have normal breathing which is very essential to the healthy development. If you have a tooth erupting, either buccally or lingually, it is usually due to a lack of development of the arch necessary to accommodate it. By extracting it you further exaggerate the condition and you have a worse case than you would have had had you left the tooth where it was.

I have a few cases which, with your kind permission, I would like to throw on the screen to illustrate what I have already said.

My first is an illustration of a child of twelve years of age, with the two centrals in lingual occlusion. The child was an habitual mouth breather. My next illustration of the case under progress, and I am pleased to say that her mother informs me that she at present sleeps with her mouth closed and breathes normally. My next illustration is a case which, from the history of the case obtained from the patient, a bright girl of fourteen years. She informs me that when she was taken for treatment, some years ago, that her teeth were in a similar position to my first illustration. The two laterals were extracted together with the right first bicuspid to accommodate the two cuspids that were erupting laterally, with the result you have before you. The arches were so contracted that the child cannot get an ounce of air through her nose. My next illustration is another case where a right lateral was extracted to accommodate a cuspid that was erupting labially with the results which you see seven years after. My last is an illustration of this case under progress, and I have since replaced the lost lateral artificially.

The necessity for extraction I consider very rare, that at least has been my experience. Rather than resort to extraction, I might almost be inclined to say leave the case as it is until such time as the patient is in a position to undertake the case without the necessity for extraction. Time I consider of no object provided ideal results can ultimately be obtained.

PRINCIPLE OF ORTHODONTIA TREATMENT.

The principle according to which practically all orthodontia cases are treated to-day, the principle which was given to us by Dr. Edward H. Angle. It is that the best balance, "best proportion of the mouth in its relation to the other features, require that there shall be the full complement of teeth and that each tooth shall be made to occupy its normal position—normal occlusion." I might add that the same principle applies if we would have the most efficient dental apparatus, and the best general health and development.

In closing, I again wish to compliment the essayist in the efforts he has put forth to bring this important subject before the general practitioner.

Hoping that I have not wearied you too much, and thanking you

for the honor you have conferred on me in opening the discussion on so important a subject.

R. G. McLAUGHLIN, D.D.S., TORONTO.

The essayist is to be congratulated on his courage in undertaking a paper of this character, and also because of the good common-sense he has brought to bear on the whole subject.

We are all aware that the general practitioner is not expected to go into this subject, but Dr. Hill has shown that it has been his aim to do the best possible for his orthodontia patients even in the midst of a heavy general practice.

The title of the paper itself calls for a word in passing—"Methods Short of the Ideal for the General Practitioner." It appears to me the general practitioner, especially the one outside the large centres, might in these cases have before him two ideals, the one constant and unchanging—a full, rounded arch, with every tooth in proper occlusion. The other ideal might be defined as the best possible for this particular patient under the circumstances.

In listening to the paper one cannot but see that it is in maintaining this second ideal that Dr. Hill has been able to render such valuable services to his patients in the field of orthodontia. The principle has been clearly laid down by the essayist that it is the duty of every practitioner outside the large centres to so fit himself as to be at least qualified to undertake the more moderate cases of orthodontia. The essayist touches a vital point when he speaks of so many dentists avoiding or neglecting such work when possible. I think you will fully agree with me when I say that too strong language cannot be used in condemning such negligence on the part of the dentist.

When a young patient is brought to the general practitioner, presenting a case of mal-occlusion, whether residing in a large city or an outside district, it is the duty of the dentist to at once take that patient into his confidence and acquaint him with the nature and cause of the deformity and the possibilities of correction under proper treatment. But to look on such cases with studied indifference, or to turn the patient away with the statement that "nothing can be done," or that "time will help matters much," is pursuing a course little short of criminal.

I am well aware there are many in our profession who take the stand that the general practitioner should not undertake a case of orthodontia. And very good arguments are advanced in support of such a position. This, no doubt, is a splendid ideal to have before the profession. But in Canada to-day it cannot be carried out in practice. No doubt in large centres every patient who so desires may have the services of the specialist. But not so in the smaller cities and towns. So we must come again to the conclusion that the general practitioner in the smaller places, if he wishes to do the best for his patients, should so instruct himself as to be able to undertake at least the simpler cases of orthodontia.

Further, I think every practitioner, no matter where situated, should be well informed on the basic principles governing occlusion. Then he will be capable of detecting any threatened deviation from the normal at the earliest moment, and by proper advice and treatment often avoid more serious complications in the future.

I believe every dentist should have at least sufficient knowledge of the subject to carry him that far. Then he will have discharged a very important duty to his patient.

Dr. Noyes, of Chicago, makes the very practical suggestion that the dentists in different sections of the country meet together and choose one of their number to take a special course in orthodontia and have their patients referred to him for treatment in this special line. I think this is a suggestion that is worthy serious consideration.

My experience in orthodontia has taught me that the simplest appliances are generally the most efficient. The essayist has apparently made considerable use of the jack screw and the Jackson crib. In my own cases I have used little else than the Angle expansion arch and silk ligatures. I am convinced that most wonders in orthodontia can be brought about by the proper use of these two simple instruments.

Dr. Younger, of Paris, is a very enthusiastic advocate of the use of silk ligatures in orthodontia work. In fact he claims to seldom use anything outside of silk ligatures, properly prepared and adjusted. In his own words, he "can accomplish almost anything in the way of moving teeth with these little strings."

I was not surprised to notice that the essayist did not deem it necessary to lay much stress on the question of retention. The error that most of us have made in undertaking the work is that once the tooth is moved to the position we intended the matter of keeping it there was "dead easy." The more we practice orthodontia the more respect we will have for the matter of retention. If I were placing the three stages into which each case of orthodontia can be divided in the order of importance I would place diagnosis first, retention second, and moving the teeth last.

You can move a tooth to almost any desired position, but to feel sure it will so remain after the retainer has been removed is quite another matter.

My experience has led me to this conclusion, that if the tooth or teeth are moved, individually or collectively, to the positions nature intended them to occupy, the retaining appliances need only be worn for a comparatively short time, for the simple reason that the forces to which properly placed teeth are subjected are so nicely balanced as to hold them in position. But, on the other hand, if the orthodontist in moving and placing a tooth is working in opposition to these forces, he will find that, no matter how long he may leave the retainer in place, the tooth will soon after return to its former position.

My concluding word should, perhaps, be one of apology, for I find I have confined my discussion to a great extent to the principles underlying the work. However, these are the things that should come first, and the methods for individual cases may well be left to the general discussion which follows.

DR. HOGGAN.—Mr. President and Gentlemen: I am sure that I enjoyed very heartily that part of the paper which I heard. Unfortunately I was a little late, but from the discussion, which gave one some idea of it, I must admit the Doctor covered the principles as they should be outlined very well. The principles of orthodontia short of the ideal must be radically different from the principles, as we know them, of orthodontia, and to say very much about my experience in that particular line would be a myth, since I have never tried it; and I would feel very dubious about trying anything short of the ideal on account of my knowledge of occlusion and feeling how much the retention of any case depends upon normal occlusion. I believe that the Doctor advocated in the latter part of his paper the extraction of the bicuspid for the introduction of the permanent cuspids. I believe if there is any case which admits of extraction that would be it. I believe that if there is any place at which a case of that kind might be treated in that manner it would be in those small towns or in the rural places, at which it was not possible to get to the orthodontist. The question of fees might affect such a principle, a patient who could not afford to pay the cost of having the case treated properly; but when one sees the great number of cases of mouths that are practically ruined by attempts at short cuts it makes one very anxious indeed about the result; it makes one quite hesitant about starting any such case. We, in confining ourselves to that work, see perhaps more of those cases of failures than many others. We have placed in our hands many cases that have been attempted through extraction in treatment and have to treat those cases over again for the purpose of regaining the space which was lost. If there is any primary reason for treating these cases it is for the development of the face. The primary object in the patient coming to us is the personal appearance, and I think I cannot too strongly emphasize, gentlemen, the very great importance of a thorough knowledge of diagnosis before you attempt any such work as extracting teeth.

DR. WEBSTER.—Mr. President and Gentlemen: I do not like to let this subject go without having had something to say about it, because I believe there is a misconception in the minds of some as to what you really have to go up against in a small town or in a practice such as Dr. Doherty has at the present time on his hands. I wanted Dr. Doherty to say something about this. Jimmy Smith comes into your office at 14 years of age, or 15 we will say; his lateral incisor is in linguil position; the centrals are apparently all right, but one cuspid is in contact with the central; this lateral incisor bites his tongue so that he can't talk very well. He says it is

no use; hadn't I better have it removed? Now, you know that Jimmy Smith's mother is a widow and she is probably working at a dollar a day washing and she has three children to care for. How is the ideal going to be attained in this case without a very great deal of charity being done by some person? Now, sir, so far as saying let us do nothing or let us do it right, leaves only two positions. Why not a third? Take the tooth out of the way and let Jimmy talk if he thinks he can talk better without it? I am giving you an extreme picture, but there are a number of gradations between that and the real ideal, but let us think about it in that light. I would like Dr. Doherty to tell us about the hundreds of cases he is meeting right along now and how he is managing to get the ideal carried out. (Applause.)

DR. DOHERTY.—Mr. President, Ladies and Gentlemen: I had no idea I would be called upon to take any part in this discussion. However, it seems to me that an outsider hearing a discussion on orthodontia, if he had a sense of humor, might be rather amused at times, because there is absolutely no doubt that none of us have the least doubt about the principles of orthodontia laid down by Dr. Angle and others. There is no question where we have cases in our offices and elsewhere that we feel we would like to see these cases dealt with ideally, but I have had an opportunity in the last month or so of seeing the thousands of cases there are in this city requiring treatment of some kind where the patients are utterly unable to pay anything or utterly uninterested. I can quite agree with Dr. Webster that there are cases where the extraction of a tooth could be done in a few minutes and might do some good and would fall very far short of the ideal, and I quite agree with him in that particular.

DR. KINSMAN.—Speaking about Jimmy Smith, I am sorry I wasn't here to hear the essay, but supposing Jimmy Smith came in at the age, we will say, of ten or eleven, with four six year molars so badly decayed and the roots in such a bad condition that you could scarcely manage to fix those teeth even by crowning, what result would you expect in the line of occlusion and nasal space for air if the four six year molars were taken out before the 12 year molars came into place?

DR. WEBSTER.—I have just heard since Dr. Kinsman sat down that Dr. George Jordan here had that done in his own mouth before the second molars erupted. If any of you wish to know what would happen look at his teeth.

A Voice: Can he breathe?

DR. WEBSTER.—I should say certainly he can breathe, because he won the 440 yard graduates' race in the university games; I think also the half-mile.

DR. GRIEVE.—I think it is a pity to pass from this subject without giving it a good deal of consideration. I would rather not say anything about it at all because I am speaking from the standpoint

of the specialist. There are many things that might be done. The case of Dr. Jordan may have turned out all right. I feel myself among the general practitioners there is a feeling that Grieve or Hume or whoever it is that is practising orthodontia as a specialist has an inflated idea about it. That is not right. I am sure that is not right in the case of any specialist; and there are many things that are done by the general practitioner through good faith that are entirely wrong. Many a time he errs in his diagnosis. If you follow out the point brought out by Dr. McLaughlin, that diagnosis is the most important point, retention is next, and then treatment last of all, and if you will bear that in mind and get down and study the cases and find out what you should do before you do anything, then I think you will have better results. The boys at school will not give any attention to orthodontia; they will try to slip over that and try to get as little as possible; they want to put in gold fillings and inlays and make bridges and that sort of thing. There is no doubt about it, the man in the town where there is no specialist has got to do some orthodontia; he should fit himself to do that just the same as he would fit himself to make a gold inlay; it is just as important, and in many instances more important, he should do so. You have lots of evenings in which you spend your time in many ways; you might as well spend your time in reading literature about orthodontia, and after a while you will find yourself at the point where you will do as good orthodontia as is possible in general practice. I am making a lot of mistakes myself, and I feel that I am, and I am all the time trying to improve and overcome those. But the man that will look at a case casually in the mouth and not have any models and says, "I will take out that lateral and draw that cuspid over, and it will be all right," is wrong. It is not all right; that case comes back to me. If you remove one tooth from the upper arch and none from the lower you have the two arches of the circle unequal. You take one out of the lower arch and the lips will act on that until you have crowding of the upper and you have got to remove one. So if you are going to remove one from either arch you had better remove one from both arches, except in some cases where possibly you may remove the first bicuspids and retain the other, and then you will get a locking occlusion if the cusps all lock; but you remove a first molar—(in Dr. Jordan's case it might have been at an ideal time, and he may have good occlusion, but I doubt it very much)—if they are not taken out just possibly at a very ideal time the 12 year molar will not come up and stand to its place true; it will lean, and if the second bicuspids is in place it will dip distally and the second molar tip mesially, and you have a condition that Dr. Fossum spoke of; you can't bridge it and do it ideally, because your abutments are at the wrong angle, and you get a pocket where foods always jam down in all the time from the tipping; and another thing, you lose the forward development of all the space anterior to where that

molar came out of. Consequently you have got the chin away back and the upper away forward. There is no use going into these different points. If every man would get busy and study a little orthodontia and try to develop himself the same as in any other part of the work, how much better it would be; and, as Dr. McLaughlin says, give diagnosis the thought and time, and then, after you get it correct, your next important point is retention. If Jimmy Smith's mother can't afford it an arch might be put on with silk ligatures and you might not need to see Jimmy Smith for several months again. You get considerable extension there without seeing Jimmy Smith or charging his mother very much for it.

DR. McLAUGHLIN.—May I ask Dr. Grieve or any other specialist in the room this question before the discussion closes. I think the Doctor stated a case or gave an illustration of the lower anterior teeth being irregular or crowded and the other teeth in both arches in proper position; and I think there was some advice that if that tooth were extracted and the remaining anterior teeth moved in proper position certain results would happen. But the point is this, can we have a case like that where the lower anterior teeth are jumbled, crowded, irregular and the upper arch in occlusion? I have hunted through my record for a case similar, and I just wondered whether that condition of things is at all likely or is possible.

DR. HOGGAN.—It certainly is impossible to have normal occlusion of the upper teeth and crowding of the lower.

DR. HILL.—Mr. President: I think I got off rather light; you didn't hit me too hard. I think Dr. Juvet's discussion was more in line with a specialist; that is, he looked at the ideal; I didn't look at the ideal; I looked at what was going to be the best for my patients. In the small towns there are a great many cases just the same as Dr. Webster mentioned. I thank Dr. Webster for his reference to that; it helps me out quite a lot on the line that Jimmy Smith's mother would not be able to pay; but there is also the fact back of that, if you do that work at a very small fee, no matter how thorough or ideal you complete the case, the result is in a small place that every other case of orthodontia that comes to you has to be done for the same fee, and you have got to consider that.

In regard to the extraction of a lateral, Dr. Juvet spoke of always making room. I didn't wish him to understand I extracted every lateral that came; I only extract them in cases where the patient is 15 and over and the arch is practically crowded inside. So that when there is not any room there and you can take it out you are not allowing it to close up or contract: it is a question of doing the best under the circumstances.

In regard to those four molars where they are bad, very bad and nothing can be done for them that is going to be of any lasting benefit, and the rest of the mouth in normal occlusion, I have a number of times taken them out myself, and I have found where they

were taken out at ten years of age I have several cases that you can't tell but what that second molar was the first, only from the shape of it; and as far as the anterior teeth are concerned, and the appearance of the nostrils for breathing, I don't think it has affected the face in any way that is noticeable. With reference to the lower teeth that Dr. McLaughlin called attention to, I saw a case just a matter of three weeks ago of a young man of eighteen in which the lower lateral was inside; it stood inside the arch and interfered with his tongue; he was learning to play a cornet; I removed that lateral, and after it was removed and the gum healed there was no space there and the rest of his teeth are in normal occlusion and are perfect.

Unless it is a case of extraction, where there was absolutely nothing else could be done, I don't think anybody should undertake a case without making a model. As Dr. Grieve says, I think the case should be studied before anything is done. I don't think anybody should attempt to remove an inlocked tooth or do anything in orthodontia without making models and examining the thing from the best point of view and then undertaking what he considers to be the best thing for the patient.

ANAESTHETICS IN DENTISTRY.

EDGAR PAUL, D.D.S., TORONTO.

Read before Ontario Dental Society, Toronto, May 31, June 1 and 2, 1911

The alleviation of pain by the use of anaesthetics in surgical operations has been the study and life-work of many prominent men in the last century. It is interesting to note the prominent part dentists have occupied in the introduction and development of the different anaesthetics. It is a matter of pride to me, and should be to every dentist—the fact that it was a dentist who first intentionally produced surgical anaesthesia. We are all aware that Dr. Wells first discovered the use of N_2O as an anaesthetic for the extraction of teeth, but further than this, the first recorded operation in general surgery performed under a general anaesthetic took place at Boston General Hospital on October 16th, 1846. Dr. Warren was the surgeon and Dr. Morton, a dentist, was the anaesthetist; the anaesthetic used was ether, his own discovery, and the anaesthesia was a great success.

The history of anaesthesia is very interesting and more or less extensive, but every dentist should be familiar with it and lose no opportunity to inform his patients and friends that the dental profession is responsible for the discovery and introduction of most of the general anaesthetics in use at the present time.

It is unfortunate that there seems a growing tendency on the

part of the profession to transfer the matter of general anæsthetics to the physician, and this attitude is being reflected in the public mind, as it is quite frequently a matter of surprise on the part of patients to know that a dentist is permitted to administer an anæsthetic except in the presence of a physician.

Surely by right of discovery, coupled with efficient training and instruction, the dentist should be considered capable of administering anæsthetics and, on account of the many opportunities for their use in the practice of dentistry, it is incumbent on us to so familiarize ourselves with them that use can be made of these valuable agents where indicated. The nature of the operations to be performed in dental surgery seldom demand a protracted anæsthesia, and on account of this the dentist has little opportunity of securing much experience in the administration of ether and chloroform. In fact there seems to be a balance of opinion in favor of consulting the physician in the administration of ether or chloroform, especially the latter. While we have the legal right, and in many cases as much or more ability than the physician, still "what is lawful is sometimes not expedient," and, taking it on the whole, in my opinion, I consider it a wise course to pursue. This may seem contrary to what I have said above, but what I advise is to become so well acquainted with the other anæsthetics that you will not need ether or chloroform, as every dental operation with which I am familiar can be performed without resorting to these more dangerous anæsthetics.

In the consideration of this paper I will confine myself to the use of what is more generally known as dental or office anæsthetics, viz.: N_2O , N_2O and O , Somnoform and Ethyl Chloride.

I have said and I still believe that there is very little excuse for the infliction of pain in most dental operations. To my mind it is a disgrace to any dentist to perform such a painful operation as the extraction of teeth without the use of a general or local anæsthetic. In my own practice, I absolutely refuse to do so, and I am especially careful of the children. Such operations as the extraction of teeth, removal of pulps, lancing abscesses, opening abscessed teeth, in many cases sensitive dentine prophylactic treatment can be performed absolutely painlessly by the proper use of local and general anæsthetics and a little painstaking on the part of the dentist.

In considering the different anæsthetics, it will be impossible to go minutely into the detail of the physiological action or the mode of administration of all of them, but will give a brief summary of some experience gained from practical experience.

Certain general preparations should be made for all anæsthetics. Absolute safety or freedom from risk does not exist with any anæsthetic, and so the anæsthetist must be prepared for an emergency which may arise at a most unexpected moment, due directly or indirectly to the anæsthetic.

1. Have your operating room bright and clean, as quiet as possible, and, if possible, avoid extremes in temperature.

2. Prolonged fasting is undesirable, as the patient often feels faint after the operation, and still it is considered wise to have a space of about two hours after a light meal before the administration.

3. Have a lady assistant if possible, who, if capable, can wield a great influence over your lady patients, especially in removing their fear by assuring them of the simplicity of the anæsthesia, the freedom of pain from the operation, and, in many cases, put in a word of commendation for the dentist as to his ability and careful treatment, and citing the great success of some previous and similar operation. Where you have an assistant, it is advisable not to allow friends in the operating room with the patient, unless they happen to be accustomed to similar operations—as a doctor, dentist or nurse would be.

4. It is always wiser, especially with children, to have the bladder empty.

5. All tight clothing, as collars, neck bands, waist bands or corsets, must be loosened, and all foreign materials, such as artificial dentures, gum, tobacco, must be removed from the mouth.

5. Have all operating instruments, especially forceps, concealed.

7. Have your hypodermic syringe charged with a fresh solution of 1-30 to 1-15 gr. of strychnine. Near by have tongue forceps, strong mouth gag, brandy, ammonia.

8. All the while the dentist must appear master of the situation, and, if very nervous, attempt to conceal it. With the patient comfortably seated in the chair, the anaesthetist should make a diagnosis of the case, chiefly by observation and inquiry. For the use of the anæsthetics I have named no elaborate examination is necessary. In fact, such a high authority as Sir Joseph Lister condemns these preliminary examinations as likely to disconcert the patient. Much information can be secured without the patient's knowledge. He (the dentist) can readily see whether the patient is old or young, anæmic or plethoric, feeble or robust, nervous or composed, and can also note the presence of any physical deformities which would contraindicate the use of these anæsthetics. Let me read what Hewitt, probably the greatest living authority on anæsthetics, says:

“Of the numerous misconceptions which still exist concerning the effects of anæsthetics, that of gauging the risk of anæsthesia by the state of the patient's circulation is perhaps the most conspicuous. It is often erroneously supposed that the possession of a vigorous vascular system affords a guarantee of safety, whilst the existence of organic cardiac disease or of a so-called weak heart almost contraindicates surgical anæsthesia. As a matter of fact, a pricesely opposite view would more nearly approach the truth.”

NITROUS OXIDE.

It is now established that N_2O is an anæsthetic and does not produce unconsciousness by asphyxia, as heretofore supposed. Any asphyxial phenomena, such as marked cyanosis, is, as a rule, due to faulty administration. N_2O has the reputation of being a very safe anæsthetic, and so it is, but still those who use it a great deal will have cases that cause them some alarm. I have had about three cases where the respiration had ceased, and two of these patients were strong, healthy females. The other was a man, a nervous wreck of about 60 years of age. In the first two cases a few thrusts in the abdomen served to revive the patients in about a half to one minute. The latter case was more obstinate, and we resorted to the administration of oxygen by pressure, together with artificial respiration, and in about two minutes respiration resumed. In coping with emergencies which may arise, my conclusion is that, either in cardiac or respiratory failure, drugs, while possessing some merit, are secondary to assisting nature to restore normal condition. In either case put patient in recumbent position, with the head even lower than the feet, and in respiratory cessation resort to artificial respiration, being sure that all clothing is very loose.

SOMNOFORM.

When Somnoform was introduced to the profession in Canada, something less than five years ago, I was very loath to use it on account of its safety and merit as an anæsthetic not having been sufficiently established. However, in consideration of the fact of being responsible for the teaching of these anæsthetics at the College, and also on the recommendation of such men as Dr. DeFord, I decided to try it and learn of its action at first hand. It seems unfortunate to me that an anæsthetic that has proven to be such a valuable one should have been exploited and introduced in such a commercial manner.

On account of the portability of the apparatus necessary for its administration, all other things being equal, it is by far the most convenient anæsthetic for a dentist outside of the large cities to use.

The formula has been changed within the last year, but the action of the anæsthetic remains almost the same, judged from a clinical point of view, although the manufacturers claim the reduction of the Ethyl Bromide lessens the disposition to excitement and also the danger. The formula at present is: Ethyl chloride 83%, ethyl bromide 1%, methyl chloride 16%.

The idea of Dr. Rolland, the discoverer, Dean of the Bordeaux Dental College, France, was to produce an anæsthetic of such a volatile nature that when it was breathed into the lungs and came in contact with the pulmonary alveoli the tension of the gas would be so great as to cause it to be easily and rapidly absorbed by the blood. This, he claims, he has accomplished. It requires from 25

to 30 cardiac pulsations for the blood to make a circuit through the body, and as the normal heart has about 72 pulsations to the minute it therefore requires about 25 seconds for the blood in the lungs to return again. Its (Somnoform) ready absorption by the blood, due mostly to the high tension of the gas, accounts for its more or less rapid action in producing anæsthesia.

The action of Somnoform on the nervous system is peculiar in that, except in the continued administration, there is very slight effect on the cerebrum. In short, anæsthesia, unconsciousness, is brought about by the action of the anæsthetic on the cerebellum. Now this phenomena has a physiological value on account of the lessened risk and danger, as the more vital nerve centres are located in the cerebrum. These experiments were performed and vouched for by the International Congress of Medicine at Madrid in 1903.

Extensive laboratory and clinical experiments have been made to ascertain the action of Somnoform on the blood and blood pressure, and the cardiac and respiratory apparatus in general; the conclusion reached has been that the only effect it had on the cardiac or respiratory systems was slightly to increase their respective rate of action.

My own experience with Somnoform has been very satisfactory, and I regard it as a very safe and valuable anæsthetic. Although I only administer once to every eight times of N_2O , still I have given it about 595 times to date.

The action of ethyl chloride is very similar, as learned from about 40 administrations. From a clinical point of view, Somnoform seems to be a much safer anæsthetic than ethyl chloride, as the death rate with ethyl chloride is approximately 1—15000, while the death rate with Somnoform seems to have been about 2 to 4 in 12,000,000 administrations.

To date I have never had a case that caused me the least concern, and for children I regard it as superior to N_2O on account of its freedom from muscular movements and respiratory embarrassments sometimes present in young children. However, I do not regard it as as good an anæsthetic for men as N_2O on account of the difficulty in controlling the patient when recovering from the anæsthetic. There is a stage when the patient is recovering from Somnoform that you cannot do any operating, and still the patient is not responsible for his actions, and in the case of strong men they might easily do damage.

In the case of patients suffering from dyspnœa from any cause or from large tongue, much enlarged tonsils, or goitre, they will find it much easier to take Somnoform than N_2O on account of the tendency of N_2O to cause swelling of the tissues along the respiratory tract.

When asked my opinion of Somnoform, my own clinical experience should recommend its use, and still I continue to use N_2O in preference in most cases on account of its recognized and established safety.

Briefly, regarding the administration of Somnoform, I give it very slowly, and the induction period is nearly as long as with N_2O . In order to appreciate the wisdom of this method a person only has to take it himself, a very wise plan to adopt with most anaesthetics, although not necessarily to the full anaesthesia stage.

NITROUS OXIDE AND OXYGEN.

Very much could be said regarding this anaesthesia—sufficient for a paper in itself.

This much can be said regarding it—that there has never been a death attributed to its use—a statement which is not true of any other anaesthetic, and, of course, it is generally used in those cases where most other anaesthetics would be contraindicated.

For certain cases it is almost indispensable. For very delicate patients, very old patients, patients with little reserve strength and vitality, this anaesthetic can be given without any apparent strain on the respiration or circulation. Any bad effects the N_2O might have are overcome by the oxygen—such as cyanosis, stertorous or embarrassed breathing. In my office I always use the nasal inhaler for this anaesthesia; and the patient can be kept under for some time in cases of extensive or difficult extractions, removal and cur-retting of the alveolar process, making exposures of pulps and sometimes their removal.

Of course this anaesthetic has its disadvantages. It is very difficult to administer in order to secure the proper proportions of the gases, which knowledge only comes by experience. Then much more of the N_2O is used than when used by itself, and the apparatus for its administration is quite expensive. Then occasionally you will meet a patient who cannot be anaesthetized.

However, where a person is giving anaesthetics a great deal, it is most satisfactory to have an anaesthetic of this description to use with some of the very difficult and trying cases which sometimes present themselves.

DISCUSSION.

DR. CLEMES.—The paper was so well and so fully written that it seems to me I have very little to add to what has already been given by Dr. Paul. However, there are one or two points—one point particularly—in which he and I make a little change in our method of administration. The one is with regard to the position of the patient in the administration of gas. Now, as he told us, he has the patient, if I remember right, cross their legs. Now I have them put their feet straight out before them; and instead of catching the chair I have them clasp their hands in their lap. As the contraction of the muscles takes place during the administration of the gas the hands become somewhat clenched and that prevents them offering any resistance to the operator if the operator happens to be alone. In my office I have always a lady assistant when I give an anaesthetic, and she helps me considerably, espe-

cially with lady patients. I allow the lady assistant generally to turn the gas on. I have a little wrench for my gas cylinder, for I give gas principally, and she follows my instructions, a little faster or a little slower as the case may be. I have taken out as many as eighteen teeth with one administration; oftener I don't get out more than half a dozen. However, it has given me real satisfaction. I have used Somnoform a number of times. I have not the ordinary apparatus for giving it, and I have not had the same experience with that, and I don't know whether it has been quite as satisfactory as the gas has been with me.

DR. MUSGRAVE.—I was very much interested in Dr. Paul's paper; it is a line in which I rather have a hobby myself. I would like to ask Dr. Paul by way of explanation does he find the duration of the anæsthesia under Somnoform longer than that of gas? I was going to say that I was very much impressed with Somnoform, seeing it given first, and I went to the International Dental Association at Buffalo and saw a specialist from Pittsburg give it a number of times, and I might say the anæsthesia did not last as long as I held the patient under gas, therefore I never adopted Somnoform.

We want something in the way of an anæsthetic that will step in between gas and ether and will hold the patient a little longer, and if Somnoform will do it then it will fill that long-felt want. Whether this operator in Buffalo I refer to was afraid to administer it long enough or not I don't know, but his operation did not last so long as I had the pleasure of holding the patients under gas. I was talking to a nurse who recently graduated from St. Luke's Hospital in New York, and she said the favorite anæsthetic for minor operations was commencing with gas and ending up with ether. This is a little irrelevant to Dr. Paul's paper, but from what I could glean from her, for minor operations lasting five minutes the doctors there claimed that this was one of the safest anæsthetics almost that they had. To me it is unknown. I would say this, that the longer I administer gas the more faith I have in it. I really think that the erroneous idea that has gone out to the public that these anæsthetics are hard on the patient has done a great deal of harm. I hold that the dentist who extracts or performs an operation without an anæsthetic is doing a greater injury to his patient than a man who performs it with. The shock attending any operation apart from anæsthetics is much more severe than the shock with. I make a study of the human system, and there are only one or two classes of patients I dislike to give the anæsthetic to, and one is in an advanced stage of Bright's disease and the other is in consumption where the lung has not the proper resistance to inhale it. I would say to the younger man of the profession that in some cases the administration of gas is dying out in some sections, but the day is coming when it will be more popular than ever.

DR. CLEMES.—I would like to add my testimony to the experience of Dr. Musgrave, who has just spoken with regard to the effect of gas or an anæsthetic on a person having a tooth extracted, and one without. I find from the number of teeth extracted that the shock which a person has is far greater than the shock which a person's system has when they are in an unconscious state under an anæsthetic, and I find that it is far better, even if there are only one or two teeth to extract, to do it under an anæsthetic.

DR. JONES.—I have found some difficulty to determine when the patient is anæsthetized; I have found muscular relaxation is the only sure test, and I would like to ask Dr. Paul to minutely describe the symptoms he watches for while the patient is anæsthetized.

DR. FLEMING.—I would like Dr. Paul to describe the position of his patient in the chair. Personally I always give the anæsthetic in a semi-reclining position; I have been told other men prefer the patient sitting bolt upright. As for Somnoform, I have never used it for the simple reason I didn't know what to do if I got in trouble.

DR. PAUL.—I am sorry everybody agreed with the paper so well. I am sure if Dr. Abbott was here there were two or three points he would have jumped on with both feet; I knew that when I wrote it. In regard to the position of the patient, Dr. Clemes speaks about clenching the hands. I have had patients where they did clench their hands, and after they recovered from the anæsthetic they had clenched their hands so tightly it was some time before they recovered the sensation in their hands. In regard to crossing the knees, all modern dental chairs are made with a fixed footrest. If you have a movable footrest it is all right to let the patients have their feet out straight, but you can't get a chair that looks anyways decent with a movable footrest. For that reason I use the ordinary modern chair, and resort to that means of getting over that difficulty. Dr. Musgrave speaks of the duration of Somnoform as compared with nitrous oxide. The duration of Somnoform depends largely on just how far you push your anæsthetic, and it also depends largely on your patient. A strong, vigorous patient will come out of the anæsthetic much more quickly than a thin, delicate patient, but take it on the whole you can always get a longer anæsthesia with Somnoform than with nitrous oxide. That will vary, of course, but you can get anywhere from 40 to 90 seconds available anæsthesia under Somnoform. As to the relative safety of ether as compared with these other anæsthetics, statistics go to show there is about one death to every 15,000 administrations of ether. At that rate it is a much more dangerous anæsthetic than Somnoform has proved to be. In connection with patients being nauseated, there is a larger proportion nauseated with Somnoform than with nitrous oxide. The symptoms of anæsthesia have been spoken of by Dr. Jones, and one gentleman suggested I speak about the quantity of Somnoform I give.

In the case of children I give a 3 c.c. tube. In the case of the

adult 5 c.c., and with a strong, vigorous patient it is sometimes necessary, to reach the stage I want to reach for extensive extraction, to possibly add another tube of 3c.c.

The symptoms of anæsthesia with Somnoform are not so marked as with nitrous oxide; there is no cyanosis; there is no stertorous breathing, but still the symptoms are sufficiently marked, and you can easily tell whether you have reached a proper stage. In the case of simple extraction where you have to take out one or two or three simple teeth, once you have secured muscular relaxation you have reached the stage where you are safe in extraction. That as a rule is the first stage in anæsthesia. Sometimes you will not get muscular relaxation all through the anæsthesia. That is the exception. I seldom use nitrous oxide for children except in a case where I have an extensive extraction, where I have a great many teeth to take out. In the case of females I nearly always use Somnoform. After you have secured muscular relaxation you keep administering the anæsthetic. As a rule the next indication you will get is loss of corneal reflex. By this time you will notice a soft snoring in the throat; that is nearly always present; it is one of the best guides to anæsthesia, because when you get that soft snoring sound your patient is generally well under the anæsthetic, but I often push the anæsthetic even further than this to secure the cornea reflex abolished. As a rule when you have that your patient is under quite as far as it is necessary to put them under without giving them an overdose. As to the position of the patient in the chair, spoken about by Dr. Clemes, I just use the ordinary operating position. I get the patient seated as comfortably as I possibly can, with the head in line with the body and the neck as comfortably situated in relation to the body as possible.

THE DENTAL LABORATORY.

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Read before the Dental Society of Western Canada at Winnipeg, April 13, 1911.

Under the usual conditions which govern the lay-out of a dental office at the present time, namely, limited space, and high rental, the problem is very difficult, and the laboratory, being usually unseen by the patient, and therefore not contributing directly toward the impression we all seek to make upon our patients through our environment, frequently suffers in the distribution of space, both in the matter of the amount of that space, and in its position with respect to the other divisions of the office. Therefore, in the mind of the writer, a brief survey of the features which might be included in a laboratory which might be spoken of as an ideal laboratory, in position, space and equipment, would seem of great-

est utility as being best adaptable to the various conditions under which laboratory practice is carried on, permitting of the utilization or rejection of the various features mentioned, as may be seen fit by the reader.

First of all, the laboratory should have at least one window (if possible with the sill a little higher from the floor than the back of the average work bench, about three feet), opening preferably on the north on the outside of the building. The window or windows and the blinds, etc., controlling the light, should be arranged in such a way that their manipulation is possible without moving from the bench. The floor, if not hardwood, should be covered with linoleum, which is easily kept clean and waxed, and the walls preferably with a light green washable covering of the Sanitas variety. Naturally it should be within easiest reach from the operating room, and should, if possible, have an exit independent of the operating room. The basin should be close to the door leading into the operating room, and it is a stroke of good fortune if an opening connected with a chimney is found in the room. The operating room should be connected with the laboratory with an electric bell, enabling him to call or signal an assistant readily, and in the case of a switchboard in the operating room being equipped with appliances for use in the laboratory, such as an electric wax spatula, wires should be run to terminal binding posts in the laboratory, enabling the dentist to make use of this great convenience. Secondly, the laboratory should be designed in such a manner that confusion among the various operations, instruments and accessories required for these operations would be almost impossible except for the reason of gross carelessness. Each phase of laboratory work, such as vulcanite work, metal work, porcelain work, plaster investment, calcar work, casting, cleaning and polishing work, melting and pickling work, and any other or different division of the work as may be seen fit, should be allotted to a distinct space, should be equipped with a complete outfit of instruments and a complete stock of supplies necessary for the carrying on of the work, and should be as sharply divided from the other departments as it is possible to accomplish in the space at the disposal of the dentist. Each of these departments should be equipped with a separate work bench having a number of drawers, etc., designed to receive the various instruments, supplies and appurtenances connected with the work of that department, and in each of these compartments also designed to receive, as far as it is possible, each individual instrument or tool (these benches are obtainable at the supply houses, and usually are well designed, well built, and cheap), and care should be exercised to see that everything is returned to its proper place immediately at the close of their period of use.

As mentioned before, each compartment should have a complete outfit even if it means perhaps the duplicating or triplicating of

articles most commonly in use in the laboratory. Although this involves a slight extra expense in fitting out, it is soon paid for in the time saved in running around, possibly, from one bench to another looking for such as an only wax spatula on duty in the whole laboratory; whereas, if each bench were equipped with those common articles where needed, a great deal of time could be saved the busy operator by having all these things together in one department. Also in connection with this plan of sub-dividing the dental laboratory into departments, if it is at all possible it is wise to have a separate room with a partition running to the ceiling for that branch of the practice in which anything in the nature of dust, odor or material on the floor is likely to be incurred by accident, such as the handling of plaster, moulding in sand, polishing of dentures, pickling or melting metals, etc. This arrangement is favored by most laboratory workers, and certainly adds a great deal to the ease in maintaining cleanliness and system.

Of great value, especially in "breaking in" a new assistant, is the system of numbering each drawer or instrument receptacle in the laboratory, and numbering the instruments, tools, etc., to correspond, and this is where not possible, labelling the drawers. Thus the drawer in which the gold files are kept is numbered, say, No. 5, and each gold file is numbered with a five marked on the handle. And sand paper, for instance, of which it is not convenient to number each individual piece, may be kept in a convenient receptacle or drawer labelled sand paper. Thus an assistant may easily familiarize herself with a strange laboratory without troubling the dentist by questions.

Compressed air, gas, electricity, battery current, sparking or igniting current, or water should be conveniently led to any of these different benches or laboratory departments as may be necessary, as will be noted below, and in these connections the writer believes it to be a great advantage at the outset to have the water, gas and electricity for his office and laboratory so installed that they may be turned on or off at the entrance either of the office or preferably the laboratory. Thus, on leaving at night the current, gas and water may be shut off, doing away with possibility of leakage, flooding, short circuiting, etc.

A light line shaft has been found useful in some laboratories such as used sometimes in tailor shops for running sewing machines. With it one motor may be made to operate two or more fans for circulating air in summer, different grinding and polishing head in different departments, small air compressed pump tumbling box for mixing investments, exhaust fans for the hoods, mentioned below, or any other special appliance requiring rotary movement as may be required.

In some laboratories, also, a system of removing dust, noxious gases from acids, fluxes, vulcanizer, polishing lathe, etc., has proven useful, and is especially easy of installation where an opening exists

in the laboratory into a chimney or flue. Light sheet metal tubing over suitable heads of the same material may be made by a good tinsmith. If led into a good chimney the natural draft is sufficient, if led directly outside the building through a window sash or similar opening, a special exhaust fan which may be procured at fairly low cost and connected with the line shaft, may be connected between the hoods and the outside atmosphere. Compressed air may be readily obtained by hydraulic or electric pumps, both automatic and requiring little attention, and is now a necessity in every well regulated dental office, on account of its manifold uses in the office and laboratory. These installations are satisfactorily put in by reliable firms, and outlets should be placed in that part of the laboratory where the metal work, plaster work, casting work and melting and "pickling" work are done, provided with needle valves in preference to the ground cocks so often supplied. Electric ignition for dental laboratories has been mentioned. For those offices in which the alternating or D. C. 110 volt circuit is installed a 50 C. P. lamp in series from one side of the circuit connected with a lead pencil by means of a suitable length of flexible electric cord, the barrel end of which is wrapped around the partly exposed lead of the pencil, forming the ignitor. The blow-pipe, bunsen or other burner to be electrically ignited is connected by a wire to a "ground" such as a gas or water pipe. Thus when the gas is turned on and the pencil drawn across the burner, the current leaves the main wire, passes through the 50 C. P. lamp, and is reduced there, and proceeds down the flexible cord, and through the lead of the pencil, jumping across from this to the metallic burner, igniting it by the spark, and from there to the ground, following the well known tendency of electricity. In the case in which a number of ignitions are used, a main wire can be run around from the 50 C. P. lamp in close proximity to each gas burner and flexible cord and lead pencil connected with it opposite each burner, previously grounded, thus with one lamp, furnishing ignitions for any number of burners.

If the electric current is not available, a very good substitute may be found by running a pair of wires in close proximity to each of the burners, and joining them at one end by six good dry cells, and a sparking coil, each as used for the make-and-break spark on an interval combustion engine. Each burner is connected with one side of this circuit, and flexible cord (bared) at the other side, and the drawing across of the bared wire results in a spark sufficiently hot to ignite the gas.*

[Since this article was written a very simple device for obtaining a spark, made up of a scissor-like frame, which rubs a piece of flint on a piece of steel, costing about 25c., has been placed on the market, and seems to answer the purpose admirably.—W.E.C.]

A small rolling mill is almost indispensable in an up-to-date laboratory, and may be used for rolling wax as well as gold. A

sensitive balance equipped with weights, Troy and Apothecaries, is also indispensable for keeping check on precious metals, and may be procured at a very reasonable figure, sensitive to 1-100 of a grain, and incidentally if equipped with a set of metric weights and specific gravity bottle, may be used for specific gravity calculations, if necessary.

A cabinet better provided with a glass door and movable shelves should be included in the equipment for stock solutions of antiseptics, medicines, laboratory fluids, etc. These, as far as possible, should be kept in glass bottles, solids as well as liquids, so the dentist may therefore see at a glance, when in the stock any particular article is low. A most useful affair in the laboratory is a small set of pigeon-holes having compartments to correspond for each day of the week. By keeping the work on hand classified in these holes, which are labelled with the name of the days of the week, a dentist can see by taking a glance at this cabinet what is to be done and just what day it is expected to be finished. Also in connection with each department a small note book for "wants," with a lead pencil attached thereto by means of a string, is of great service in preventing those most annoying and time-consuming delays occasioned by the dentist in suddenly finding himself out of a certain material which he wished to use at short notice.

With regard to stools for the laboratory use, the writer has had the greatest satisfaction with a couple of piano stools without back, and with hardwood seats underneath which a cross brace is fitted of 2 inches by 4 inches long, and fastened to stool by a $\frac{3}{8}$ inch leg screw running up the centre, and upon which are mounted four large ($1\frac{3}{4}$ inch wheels) roller bearing castors. These are cheap, adjustable for height, and are easily pushed under the work bench when not in use.

Passing to a brief description of each of the various equipments in each of the branches of laboratory practice, the vulcanite department of the laboratory should be equipped with a good cabinet designed for that class of work, a number of good specimens of which are for sale at a reasonable figure at the depots. It should be equipped with solid top hardwood and preferably an elevated position well supported and covered with marble, galvanized iron, or some such substance, upon which should rest the vulcanizer and water heater. A sink should be near at hand, equipped with an instantaneous hot water heater, which can be simply made by making a coil of annealed copper tubing one-eighth of an inch inside measurement and about eleven feet long coiled over a solid-flame Fletcher burner and fitted with a by-pass. With this simple apparatus boiling water can be obtained in five seconds. The vulcanizer and hot water heater should if possible be covered with hoods leading to the main flues, and the vulcanizer blow-off should be led by means of a copper or brass tube well up into the main flue; or, if that is not possible, out of the window into the street.

The gas connections should be made so that they can be operated from underneath, and in front of the bench; and, as also mentioned before, should be fitted with a place for everything, and should always have everything in its place. A useful piece of apparatus for waxing up consists of small tray fitted about an inch and a half below the bunsen flame, in which the wax scraps are placed. Thus, when the operator while making a denture is engaged in setting up the teeth, the flame which he uses reduces the wax in the tray to a putty-like consistency, with which the work of modeling the last tissue to be replaced by the denture can be carried on with the greatest facility by means of the fingers of the operator, or may, if reduced below the melting point, be very conveniently brushed on with a small stiff artist brush. A compressed air valve should be located on this bench, as it is exceedingly useful for blowing the water out of inaccessible places in impressions, the rapid drying of shellac on a model, the equal distribution of the same in an impression, the rapid cooling of models, and other uses which from time to time occur. Another useful accessory is a small electric heating disk, wound so that it will reach a temperature of about 200 degrees Fahr., upon which raw rubber can be placed for warming during the act of packing flask. As mentioned before, the cabinet should be equipped with a sparker for each burner, and the other common accessories of the manufacture of vulcanite dentures, etc.

Mention might here be made of the cabinets sold in watch-makers' supply houses, for holding small parts. A small cabinet, about 1 ft. by 5 in. by 4 in., containing twelve small drawers, costs only \$1.50, and larger up to \$4.00, making a most useful receptacle for such articles as bite gauges, metal stiffeners, wire nails for isolated teeth in impressions, and similar small parts.

Passing on to the gold work department, this should, of course, be equipped with a suitably designed cabinet, the dimensions of which are necessarily not quite as large as rubber cabinet. It should be fitted with gas and compressed air cocks for case heater, and drawers containing compartments for the various instruments and appliances used for gold work. In this connection we might refer to those trays which contain the precious metals. These should be removable and of ample size and number; this last depending on, of course, the size of this branch of the practice; should be of plate glass preferably, with sub-divisions for various carats of solder and plate, and should be made so that they can be securely locked during the absence of the dentist, and included in the work bench should be a tray of ample size for holding the scraps and filings which occur during daily practice.

Mention might here be made of the varied uses to which an ordinary chemical retort stand, worth fifty cents and up, might be made of in the laboratory. For heating water, drying instruments, and particularly in soldering work in an investment, are they useful,

permitting a bunsen flame beneath and the blow-pipe flame above, giving good control of temperature. By means of a simple appliance made out of a piece of one-quarter round iron, bent to a quarter circle, and copper basket, a universal movement may be given, holding and tilting an investment at any angle to facilitate the flow of solder with a burner below and a blow-pipe above.

An oxyhydrogen blow-pipe is almost as indispensable, if much porcelain work is done, especially continuous gum, and may be had at a fairly reasonable price, and of small dimensions.

The department of porcelain work next offers itself for consideration. This department should be conveniently located to the gold soldering cabinet for obvious reasons. It should be designed in such a way that while the operator is in a sitting posture his eyes should be on a level with the porcelain furnace, which should always be made to operate from in front. In this connection it might be noted that a small piece of dark spectacle lens, mounted in a single spectacle frame and made to swing in front of the muffle, has been found to be of greatest service in watching the fusion of porcelain. Beneath this, and at convenient working height, should be a bench fitted with drawers containing compartments for the various instruments, supplies, accessories, etc., for carrying on this branch of dental practice. Also, in this connection it might be noted a simple electric arc device for the fusion of platinum scrap a coil, made by winding eight pounds of No. 18 magnet copper wire in simple series with a flat carbon, upon which the scrap is to be laid, and a common round carbon such as used for ordinary arc street lamps, suitably insulated and mounted, between which the arc is drawn off. With this simple apparatus it is quite easy to fuse small quantities of platinum scrap, and with the rolling mill, which should be always found in a busy office, can easily be reclaimed and used again, but unfortunately its use is limited to the direct current of electricity.

In passing, it might be well to note a simple apparatus which can be made from an old electric bell, by means of which porcelain can be packed with great rapidity, ease and thoroughness in a crown or inlay matrix. The knocker of the bell simply taps the porcelain in position, doing away with the necessity of the longer-drawn-out operation of jogging it down with a serrated instrument. A neat cooling chamber, made with Russian iron preferably, lined with asbestos, fitted with a small door, would be found most useful for cooling inlays, crowns, etc. It is intended that in this department only the actual operation of baking and applying the porcelain should be carried on, while the preparation of the metal frame work is intended to be accomplished on the soldering bench.

In event of the use of a pyrometer, in conjunction with an inlay furnace and continuous gum furnace, both with built-in thermo couples, the indicator can easily be made to serve both furnaces by connecting them up with a double pole switch; and

if desirable the indicator may be placed in the operating room, and the progress of the furnace in the laboratory may be watched from the chair.

From these departments we now pass on to a totally different and more mechanical branch, namely, the plaster, sand, swaging and polishing department. This, as before stated, should, if at all possible, be placed in a separate room, and should contain a cabinet with drawers, lined with zinc, and drawers for accessories, for the operation of moulding in sand, and a good-sized sink should be near at hand. The polishing stand should, if possible, occupy a separate position in the laboratory and should be completely enclosed with a hood containing a removable and washable glass front, under which the polishing operation can be carried on without fear of flying particles of polishing material and dust entering the operator's lungs; this hood being connected with the main exhaust flue. An electric light should be inserted a short distance above the mandril of the lathe, also a needle valve connected with water supply for drip on stone for grinding. The stand should be fitted with drawers containing receptacles for buffs and wheels for polishing metal, buffs, and wheels for polishing vulcanite, and a shelf for bottles of different grits to use in polishing, and various other accessories to this important branch of prothetic dentistry.

In another room should be the plaster cabinet. This should be made with a glass top preferably, with a metal edge arranged so that the plaster may be jarred down in impressions, flasks, etc. It should contain ample drawer space for flasks, tongs, spatulus, etc.; and should be equipped with a water heater, sparker, etc.; also compressed air cock. A few words might be said with regard to the arrangement of the drawer for containing waste plaster, shavings, etc., from trimming models. This should be made of ample size, so that the operator can work with his hands well in the centre, doing away with the possibility of flying bits of plaster in the room. This should be equipped with a removable tin sub-compartment, which can be emptied with ease. The drawers should be mounted on roller bearings, cheap, and obtainable at any hardware shop, doing away with binding, sticking, etc. A chute should also be provided from the top of the table for bench trimmings. A very convenient sifter for sifting plaster powder into the water may be made by having a tinsmith solder a funnel shaped piece of tin on the bottom of the ordinary Victor flour sifter, reducing its opening from 6 inches to about 3 inches. This should be mounted in an upright position, and sifts the plaster quite as evenly into the bowl as the more expensive arrangements supplied by the depots.

A useful accessory for the plaster cabinet for the rapid trimming of models is a carpenter's key-hole saw of good size, after which models can be finished with great ease and certainty by means of the plaster plane. Another section should be laid off for

the operation of melting metals, pickling gold work, refining and metallurgical operations, equipped with hood. This should be made preferably of copper and should have a glass front and a heavy metal gauze upon which to rest beakers containing acids, etc., and an electrical lamp placed inside for illumination, the hood, of course, connecting with the main ue. The table should be made with a heavy iron top, and upon this the operations of making dies with the base metals, their refining and other similar metallurgical operations can be carried on. A fifteen pound anvil of cast iron, mounted on a wooden block about 6 inches by 6 inches by 3 feet, is also very useful to receive the heavy blows of the hammer.

In a laboratory where a partitioned space existed the vulcanizer might be placed within it to great advantage, thus confining all the dirt, odor and dust to one room. The exhaust steam from this may be conveniently led up the ventilating system, through the wall to the outside, or out the vent pipe of the basin. Casting has grown to be of such importance that space must be found in the laboratory for it. Space must be reserved in the main laboratory for the casting machine, while the investing and investing materials and supplies are best kept in the plaster section. Of great convenience in preparing investments for inlays is a small water needle valve placed at the level of the eye near the investment, enabling the dentist to rapidly fill the graduate glass to the exact amount of water required for his measure of investment. With regard to the sand moulding or other form of cast moulding for swaging, one drawer in the cabinet is sufficient to hold calcar and rings, Hawes ask, etc., necessary. It should be at least 18 inches by 18 inches by 4 inches, inside, and lined with galvanized iron.

Of great aid in selecting a harmonious mold of tooth for patient, especially in crown work, is a small tooth cabinet holding about 12 drawers in which a representative molds of front sixes of the different makes are kept, not for use, but as a mold guide. Diatoric and cheap pin teeth of the manufacturers who make these in front sixes answer the purpose quite as well as the platinum, as they need not be used, except to indicate the number of the mold, and makes possible with the shade guide of harmonious selection of teeth for patient over the telephone or by mail, without the necessity of keeping a large stock.

In conclusion the writer would like to enter a plea for the very best equipment, space location and arrangement in the laboratories, especially in the laboratories of the young graduates, who are the busy professional men of the very near future. Much of the fundamental discoveries and advances upon which the science and art of modern dentistry is built, were and are being worked out in dental laboratories, and for this reason, as well as on account of the restful and remunerative laboratory work in a properly conducted dental practice, it should be a place in which its surroundings and equipments should be of such as to bring out the very best work both of mind and hand, that lies within us.

DISCUSSION OF DR. CUMMER'S PAPER.

Dr. Cowan: Mr. President, ladies and gentlemen: This paper does not deal with dental science; it deals only with the means by which we can practice that science; therefore, nothing of a technical nature can be expected from this.

There are two things to add that are of importance to me. The one thing is the ventilation of the laboratory, which is several times referred to in different ways in this paper. I want to say to you that while the teeth of your patient are very important your body is very important too, and you want to take a great deal of care of yourself. In my time I have had three laboratories. While in the first one I didn't know what was the matter with me, and I guess the other people didn't know either, but there was no ventilation in it at all, and many and many a time in the afternoon I went home feeling exceedingly seedy. My head, never any too good, was made no better by the room I had to work in, because there was no ventilation. The next room I went in was a smaller one, but it had a skylight, and that was the best kind of ventilation. The result was very satisfactory to me. I found that the fresh air which I got in there, or rather getting rid of the foul air, was the very best kind of a tonic, and enabled me to do a lot more work than I did in the old laboratory. Within the last month I have got into new offices, and the laboratory is, I think, the best part of my office. The room is 14 x 20, and I have some 30 feet of benches in it. I made up my mind to be like the old farmers down in Ontario. You go down there now and you will find fine brick houses; they all have splendid little mansions and bank barns, but when I lived there twenty or thirty years ago it was very different. They all had fine bank barns, but the people lived in log houses. The log houses were comfortable and clean, but these farmers recognized the fact that they could not get the mansion until they got the money from their stock and properly kept grain, consequently they first attended to their stock and grain, so they got their bank barns. If you are going to make anything out of dentistry you have got to get your workroom, whether operating room or laboratory, in the very best condition in order to make it profitable. I think that is what Dr. Cummer is trying to aim at, and that, after twenty-five years' experience in dentistry, is the conclusion I have come to and what I am trying to do. I have been in laboratories which are small; some of us cannot help that, but the instruments were lying everywhere. They waste more time finding things than it does to do the work. They must do it because they couldn't possibly lay their hand on an instrument or know where to go to get it or anything about it; they have to look around, as Dr. Cummer has said, to find out where things were to get them. About a year ago I had four young men working for me, and those four men were the very opposites of each other in method. There was one of them who was always asking somebody else where something was. "Did you see this?" or "Do

you know where this is, or that?" Another fellow, a young fellow whom I had with me, he was just a comparatively new student, but he had a lot of method about him, and when he was through with a certain instrument he put it into a certain place, which is the system I require from all those with me now. Those men can turn out more work to-day by half than they could when instruments were lying here and there about the office, and I want to tell you, gentlemen, that you will never make dentistry a success until you learn to do your work in a way that will save the time of your patients, because when you are wasting time on them you are wasting your own time and their time, and if they can get it done in shorter time somewhere else they go somewhere else, because it is profitable to them.

I make it a rule in my office, especially with my laboratory work, that all work of the day must be cleaned up before the day is done. We cannot always adhere to it, but that is the rule we try to adhere to as far as we can, and to do that we have got to have a system, which Dr. Cummer spoke of, of having everything in its place and knowing where we can get everything.

Of course, Dr. Cummer has got a very complete equipment in his laboratory, there is no doubt of that from the paper which he has given us. We all want to get that if we can, and it doesn't cost such an awful lot. These little things are not expensive things, and if you have them you will find that they will save their own cost in just a little while.

One thing, however, I am going to differ from him. He has a drawer here, there and everywhere for everything. Well, some things you have got to have drawers for, but I have got rid of all the drawers I can get rid of, and I have shelves wherever I can, because I found I was spending more time cleaning the dirt out of these drawers than I was in getting things out of them that were necessary. I have got shelves where the boys can clean them off every day and keep everything clean. You have got everything right before you.

Another thing is a cabinet for teeth. I think that is one of the most important things. Here, where you have dental depots, it is not so important, but in the country office where there is anything particular done, you have got to carry anywhere from \$400 to \$600 worth of teeth, and if you do not keep in proper arrangement there is an awful amount of loss. There isn't much profit in breaking up sets.

I do not work, but I go down and lower the windows and get rid of those foul gases which we work in and which become an unnatural environment. It is unnatural and yet we are so accustomed I go down there in the morning and open those windows always, even if it is cold weather. I want to tell you that cold air is not always fresh air. I get the air in circulation. I have an electric fan that I turn on the first thing in the morning, and just, in paren-

thesis, let me say that an electric fan is the best thing I have for my room after I have given an anesthetic. I never turn the current on to the patient, but I direct it over the patient, and I have that same fan in my office in the morning. I clean out the stagnant currents as well as I can and get it fresh, so that when I come down to business I will be able to do business and leave the office fresh in the evening. I do not want that electric fan running a direct current on me during the day, because I have rheumatism enough without it driven into me at a mile a minute by an electric fan. Get the air circulating above, and if you do that and get your office in running order and fairly healthy condition you will find your health will be very much better at the end of the year, and a long vacation won't be quite so necessary.

The other thing is the completeness of the arrangement, so that you can get at and do business in a business way. That is where dentists fail; they do not do business promptly. There is no sense in making a patient wait for days and days for a piece of work that can be done in four or five hours.

Dr. Harwood: Dr. Cummer, speaking of the electric spark in connection with gas. Unfortunately I am one of a large number here, I think, who have not gas at their disposal. I would like to ask (I should know, but I do not) will this electric spark light an alcohol lamp? Will it light your gasoline blow pipe?

Dr. Mitchell: I find that one of the finest things I have in my laboratory is an electric disc, on which I put my vulcanizer. I can regulate the vulcanizer just as well as you can by gas or gasoline. We always use the spark and the gasoline blow pipe.

Dr. Cummer: Mr. President and Gentlemen,—I do not think there remains very much for me to say. The doctors who have followed me have merely added a great number of valuable points to the few I have mentioned.

The electric fan is really a splendid thing. I forgot to mention the fact that there are on the market a number of electric fans that, instead of propelling a current of air they exhaust it, and, while I haven't seen one in operation, I think they would probably help us a great deal in ventilating properly. I believe you can get them for some \$25. A small fan may be connected in the room with a small metal tubing running out of the window. I believe they would probably be valuable to some one who has peculiar conditions to deal with.

With regard to the cost of the equipment such as I have mentioned, I would like to say that the cost is not in money. It is just simply in thought and in planning; the cost in money is not great, as Dr. Cowan so ably said.

With regard to the question of this spark working on an alcohol lamp, I would like to say that it will. I have tried it, only you have to make a little attachment. The alcohol lamp I used was a glass affair, which showed something like this in cross section (indicating

on board) and the wick ran down through a certain little metal attachment with a flange which rested on the top of the bottle and over the whole of that business a ground glass cap came over it. If you are suing this sparker on this you will be wise to take this metal thing off and solder a little piece of copper wire on the side, so that you will have something to draw your spark across. It will act very nicely on the alcohol lamp under those conditions. I do not think under any other.

Dr. Harwood: How about an all-metal student's lamp. Would an extra attachment be necessary.

Dr. Cummer: I think it would, because your spark would ignite very much better higher up on the wick than it would underneath there. That disc idea is a revelation to me. If science could arrange it I would like to see illuminating gas put out of the laboratory altogether, but as far as our present knowledge goes I do not think that is possible, and I think the idea Dr. Mitchell has given us is a splendid one and opens up an entirely new line of thought for me.

THE DECIDUOUS TEETH.

W. W. WOODBURY, D.D.S., HALIFAX, N.S.

Read before the Convention of the Dental Association of Nova Scotia.

Mr. President and Fellow-members of Nova Scotia Dental Association:

My excuse for appearing before you to consider our relation to the care of the deciduous teeth is not that I have anything new to offer on the subject, but that our interest may be stimulated in the matter. We hear a great deal concerning the necessity of compulsory examination of the teeth of school children. Prophylaxis looms large to-day, and "Preventive Dentistry" is increasingly the watchword of the profession. The orthodontist insists that we respect the integrity of and work toward the ideal of the perfect dental arch. In all this do we think much of the organs that serve the child during perhaps the most important period of its development? Is there not rather a danger of confining our attention almost solely to the permanent denture, regarding the others as only temporary and, therefore, relatively unimportant?

I propose to confine myself to the necessity of careful attention being paid to the deciduous teeth, and our duty as dentists to meet this need by both educative and operative measures.

The need for conserving deciduous teeth may grow clearer in our minds if we recall for a moment the function of these organs.

The nutritional function is perhaps the most important. The deciduous teeth are called upon to serve mastication at a time when the digestive apparatus has not only to take care of the repair inci-

dent to ordinary wear and tear in the tissues, but also, and over and above this, supply the cells throughout the system with material to carry on a very vigorous growth in all parts of the body. When we consider that in a large percentage of children's mouths the little teeth are in such a condition that comfortable and consequently thorough mastication is out of the question, is it any wonder that we see so many anemic young children? I think the wonder is that we do not see more.

Also the deciduous teeth must maintain space for the teeth which are to follow. Some years ago the world was interested in an engineering feat which has since become more or less common, the famous tubular bridge across the St. Lawrence at Montreal was replaced by a more modern one without interfering with traffic; *i.e.*, with the function of the bridge. A more wonderful piece of engineering takes place in the mouth of every child when the organs have not been impaired by disease. Nature undertakes the transformation at a time when traffic is at its height, when the machinery of nutrition is called upon to do its utmost, and quietly, without interfering at all with all the wonderful life processes, the little denture is replaced by the larger and stronger one—more equal to the increasing work to be done. During this process the deciduous teeth not only maintain space, but they actually make space. We know from a study of the relation of the direction of the bone spicules to the lines of force during mastication that the latter function has a very direct influence over bone development. As a consequence anything that interferes with mastication will also interfere with normal development of the maxillæ, the result being irregularity of the permanent denture.

Incidentally perhaps the æsthetic value of the deciduous teeth might be mentioned. Parents often remark the apparent oversize of the upper central incisor, appearing as they do before the face has attained such size as to be in harmony with them. If, however, these teeth should appear at the age of say nine months we should have a display putting to shame the dental equipment of the "yellow kid."

The reason then for care of the deciduous teeth is that the above important functions of mastication, maintenance of space, and supervision and stimulation of bone development may take place, not to mention the appearance of the child.

Also to be in line with those who remind us of the necessity for "preventive dentistry," there is no more efficient way to practise "preventive orthodontia" than to take such care of the deciduous teeth that they may, as intended, prepare the way for the orderly eruption of their successors. In this connection it is worth noting that if the deciduous teeth are prematurely lost there has been no way devised for making good that loss by means of bridge or dentures, aside from the attachment of united bands so placed as to maintain the space.

Moreover, the presence of disease of the deciduous teeth not only results in derangement of function, as above noted, but the pain so often attending caries has a direct effect on the delicate nervous system, resulting in strain and fatigue. Also the infection of the alimentary tract by pus from alveolar abscesses and other bacteria which find an ideal medium in the carious teeth, is likely to result in serious auto-intoxication, aside from the danger of direct infection by tubercular and other germs by way of the pieces of the roots. So much for conditions as we too often find them, but what is the remedy?

First, educative. If we can impress those of our patients who are parents of the necessity of our seeing their children's teeth when they first appear that would seem to be the ideal way. Do not let us be afraid of painting too lurid a picture of the results following neglect. Some people need a lot of shaking to wake them up.

Unfortunately we cannot always accomplish this, and many of the mouths that we see are already in a bad way, and we have before us a problem that is by no means easy to solve.

The first essential is that we gain the confidence of the patient. It is well to do as little as possible during the first appointment. Let it be short; in fact, let all children's appointments be short. Let the child become familiar with its surroundings and with the dentist. Say as little about "hurt" as possible. On the other hand never deceive a child, and if it is necessary to inflict pain I have found it the best policy to tell the child so, and I have been surprised to find what a child will stand if it feels that it can depend on you and that you will stop if requested to do so. In this way the child feels that the situation is in its own hands and a more or less strong appeal is made to its pride.

When we reach actual operative methods, I feel more like throwing the meeting open than preaching, for we are dealing with some of the most difficult problems in all operative technique. We are apt to think of work on the deciduous teeth as more or less temporary, but, as someone has pointed out in a recent article, such is not the case. It is said that the life of the amalgam filling in a permanent tooth is four years. If we fill a deciduous molar at four years of age and expect our filling to last as long as the tooth lasts we are demanding that it last twice as long as the average, and this in the face of the oft times difficult retention resulting from the comparative thinness of the toothwall, with the attendant danger of exposure. Do not let us jump to the conclusion that the so-called permanent fillings, such as gold or porcelain, are therefore the ones indicated in this work. There are other considerations besides permanency, as must not overtax our little patients, and it may be better to replace an easily inserted filling later rather than subject the child to the rubber dam or other tedious procedure. I think our attitude should be that of a well-known Canadian whom we all respect, whether one always agrees with him or not, viz.,

that in our treatment of the deciduous teeth we should seek to institute and maintain "adequate protection" against caries, and consequent premature loss. And while appearance is not to be wholly overlooked, I would personally not hesitate, if confronted with either performing a long and tedious operation resulting in an aesthetically beautiful issue, or a much shorter, which would save the tooth, but not be so beautiful to look at, to choose the latter, especially if the child were very young.

Copper cement is highly recommended for deciduous teeth. Perhaps due to faulty technique on my part, I have not met with the success I had anticipated. I have, however, in the following combination found a filling material which, while it has the same disadvantage as copper cement, *i.e.*, that of discoloration, nevertheless appears to be effective. After the cavity is prepared wipe it out with silver nitrate and insert an amalgam filling. I have found this quite satisfactory in guarding against recurrent decay.

In cavities where adhesive qualities are desirable in the filling material owing to there not being opportunity for as extensive preparation and retention as demanded for the above, I have used the combination of amalgam and zinc oxyphosphate that has been recommended, but not sufficiently long to have a very definite opinion concerning its lasting qualities.

In cases where the cavity is so deep as to almost be an exposure, and where, as a consequence, on account of thermal shock, metallic fillings would be contraindicated, I have found nothing better than zinc oxide and oil of cloves. I have found this to be much more permanent than the originally recommended combination, *viz.*, zinc oxide and eugenol and where thoroughly mixed to as stiff a consistency as possible before inserting I have been surprised at its lasting qualities. While the main body of the filling seems to be very pliable and easily removed with an excavator, it becomes highly indurated on the surface and sometimes rather difficult to penetrate with an instrument. It is rather difficult to insert the mass with a burnisher, owing to the filling material sticking to the instrument rather than the cavity, but if pressed home with a bit of spunk held in the pliers this difficulty is overcome.

Acting on a suggestion that I came across some time ago, I have found that the addition of 10 per cent. Thymol to the powder protects a zinc oxyphosphate filling against the putrescent odor that you have all noticed when burring out old fillings due to absorption and decomposition of oral fluid. I have never noticed that zinc oxyphosphate so treated had any irritating qualities.

Finally, I have found silver nitrate invaluable in inhibiting decay in location where filling appeared to be almost impossible, and in spite of its appearance there seems to be nothing to take its place.

In cases where the nerve is exposed I have used Thymol as a capping material. After sterilizing with eugenol or some other agent which is sedative as well as antiseptic, this procedure seems

to be successful where one would not dream of employing it in similar conditions in permanent teeth, no doubt due to the apical foramen and consequent minimizing of the danger of strangulation.

For treating putrescent pulps in deciduous teeth mechanical removal of decay, followed by sterilization with oil of cinnamon and filling with forma pucha I have found to be effective. We must, of course, remember that whatever the root filling material is it must be soluble, so as not to interfere with absorption of the root.

As far as the care of the teeth is concerned, I explain to the children, in the presence of the mother when possible, why a certain sort of tooth brush is desirable, and give a personal demonstration in the use of the same. Also tell them in simple language why teeth decay, and consequently why they should be brushed in a certain way and at certain times, more especially; children are rational little things and generally like to know the why of things.

By a judicious combination of supervision, encouragement and censure, where necessary, during subsequent visits one may do much to establish the habit of oral care and consequent cleanliness.

I must ask you to pardon the rather free use of the personal pronoun during the latter part of this talk, but I think that in the consideration of methods of technique the value of a suggestion lies in the fact that it has been tried by the one who suggests it.

DENTAL JURISPRUDENCE.

H. G. DUNBAR, D.D.S., NEW GLASGOW.

Read before the 21st Convention of the Nova Scotia Dental Assoc. at New Glasgow, July 14, '11.

The responsibilities of the dentist are increasing as rapidly as the advances in the profession, and a knowledge of the principles of dental jurisprudence is necessary for the guidance of the practitioner, and for his protection against litigation.

We may accept as a definition of dental jurisprudence that it is the science which applies the principles and practice of the different branches of dentistry to the elucidation of doubtful questions in courts of justice.

We may subdivide the subject into the following: Contracts, Book Accounts, The Dentist as a Witness, Professional Confidences, The Right of a Dentist to Administer an Anæsthetic or Prescribe an Internal Medicine, The Degree of Skill Required in a Dentist, and finally, Negligence.

CONTRACTS.

A contract is an agreement between two or more persons for a consideration, to do or not to do a particular thing. When a dentist agrees to do certain work or certain treatment it is a contract. Contracts are either express or implied. An express contract arises where certain work or services are stipulated to be performed for

a specific sum. If a patient inquire the price of a certain piece of work and on being told the cost agrees to pay it or tells the dentist to proceed, it is an express contract. Most of the contracts between the dentist and his patients are implied contracts. In the case of an implied contract, where the patient declines to pay on the ground that the charge is excessive, the dentist, in order to recover at law, must prove that the charge made be a reasonable one and no more than his services are worth.

The mere unsupported testimony of the dentist who seeks to recover at law is not enough. The charges of professional men differ very much and depend upon their reputation, experience and the localities in which they practice.

A dentist, at the request of a patient, fixes an hour for the patient to have work done, and the patient fails to keep the appointment or send notice of his inability to be present, whereby the dentist loses his time and is also prevented from making another appointment with some other patient. Of course in such case the dentist may recover for the time so lost. This is the legal aspect. It is a question of policy whether you employ the remedy the law provides and probably lose a patient.

Occasionally we are in contact with a case where a third person verbally guarantees the cost of work done for another. In all doubtful cases there should be a written agreement, as in most places a contract to become responsible for the debt of another must be in writing and signed by the person charged with the debt.

A husband is obliged to provide necessaries for his wife and children and a guardian for his ward.

If a patient bring you a set of teeth to be repaired you have a lien on the teeth for your work, and can refuse to deliver them until they are paid for.

BOOK ACCOUNTS.

Only original entries are of value in litigation. Ledgers and transferred accounts are not accepted. It is not necessary that the original entry is such that it can be generally understood, if it be intelligible to other dentists and is supported by evidence of the meanings of the entries.

THE DENTIST AS A WITNESS.

We may be called upon to testify to facts within our own knowledge, or as an expert, in behalf of a brother practitioner as to the reasonableness of a charge, or in an action for negligence, or as to the quality of work done, or in a criminal case of malpractice, or to identify the dead by means of the teeth.

Objection may be made to the competency of an expert, and the court will determine by means of a preliminary examination whether the knowledge of the witness, his skill and previous knowledge of similar cases are such as to qualify him as an expert.

The importance of the dental expert in cases of identification of the dead and living by means of the teeth cannot be over-estimated.

In many noted cases it would have been absolutely impossible to have established identity except by the teeth. Not only have bodies in various stages of decomposition and persons accused of murder and other crimes been identified by the teeth, but the innocence of many persons has been established by the proof that descriptions of the teeth of the supposed criminals differed with theirs.

PROFESSIONAL CONFIDENCES.

Dentistry is now recognized as one of the learned professions, and the interesting question arises whether a dentist can refuse to testify to professional confidence or information which he acquired in attending a patient in a professional capacity, and which information was necessary to enable him to act in that capacity.

In most places a person duly authorized to practise medicine or surgery is not allowed to disclose any information acquired in attending a patient in a professional capacity without the consent of the patient.

It would seem that the dentist is also included. In any event a dentist, when called upon to testify concerning information which he acquired in attending a patient in a professional capacity, who does not obtain his patient's consent should decline to testify, plead professional confidence, and submit himself to the decision of the court.

In a case decided in New York in 1889, in the Supreme Court, on appeal from a judgment of conviction of manslaughter in the first degree, the only evidence to sustain the conviction was that of a physician attending the decedent in her last moments. The physician testified, under objection, that he was called to visit a woman by the defendant, who, at the same time, in order to aid the physician's diagnosis and treatment confessed that he had attempted to poison her, and he described the manner in which he had attempted to accomplish his object. The court decided that it was necessary for the physician to know the probable cause of the patient's prostration, and without dissent said: "In this critical moment, with the sole purpose of saving the woman's life, he disclosed the secret to the physician to enable him to act rightly. To have withheld the disclosure would have made the defendant a consenting party to the woman's death. We have no doubt that the statute, both in letter and spirit, protects the confidence thus reposed in the physician and forbids him to betray it."

THE RIGHTS OF A DENTIST TO ADMINISTER AN ANAESTHETIC OR PRESCRIBE INTERNAL MEDICINE.

The trend of authority seems to be that he has that right. In availing himself of it he must be competent and thoroughly comprehend and understand the effects of anæsthetics and drugs. He must use ordinary skill and the best judgment his ability admits of.

THE DEGREE OF SKILL REQUISITE IN A DENTIST.

It is not expected that you should use the highest degree of skill attained in the profession. We are required to use ordinary skill and the best judgment our ability admits of. We are liable for want of ordinary skill and a failure to keep thoroughly informed upon the advances of the profession and the sources of knowledge.

A dentist should do little experimenting with his patients. It is his duty to follow the methods that have been tried and approved by the profession at large.

NEGLIGENCE.

If a dentist be guilty of negligence or malpractice he can be sued in a civil court for damages or may be prosecuted criminally.

If an injury be sustained by a patient by reason of the failure of a dentist to use ordinary skill and knowledge, it is negligence. No matter how serious the injury may be it is necessary to prove negligence in order to entitle a person to recover damages.

Contributory negligence is the want of reasonable care upon the part of the person injured which concurred with the negligence of the party causing the injury.

Most actions against dentists arise out of the extraction of teeth. Frequently the process may be broken or splintered away in extracting or the gum lacerated. This may be due to the unusual shape of the root or to the divergence of multi-rooted teeth.

In closing it may be noted that the possible legal conditions that may arise and involve the dentist are many, and it should be our duty to ourselves and the profession to so conduct ourselves that at any time we may be called upon to answer for our conduct we may feel that we not only have done our duty by ourselves but by our patients as well.

HOW TO TREAT EROSIONS AND ABRASIONS ON THE LABIAL SURFACES OF INCISORS.

J. FRANK ADAMS, D.D.S., TORONTO.

Read before the Ontario Dental Society, Toronto, May 31, June 1 and 2, 1911.

Your committee has given me a hard task to perform in taking up the subject of the treatment of erosions and abrasions on the labial surface of incisors. Erosions must not be confounded with caries of the enamel or atrophy of the teeth. An erosion is a defect of the surface of the tooth, characterized by a progressive loss of substance, leaving a polished or smooth surface, which cannot be accounted for by abrasion. An abrasion is the same polished smooth surface, brought about by mechanical means. Erosions are fortunately somewhat rare in occurrence. You seldom find them in any but adults, and usually in the better class of teeth and in

the mouths of the busy, active people. Erosion in its earlier stages is not as a rule noticed, but is presented after there has been considerable progress. There are various kinds, and some very peculiar and unaccountable cases. If there is a deep cutting, by shaping a wall around the outside margin of the erosion and inserting a gold, porcelain or enamel filling my experience is you prevent its further extension. When you find it at the earlier stages, by grinding the edges and thoroughly polishing the enamel, in most cases you can prevent further extension, provided the patient will present himself at stated periods for a prophylactic treatment.

Now, as to the beginning of erosion. In my opinion caries of the enamel and erosion have one and the same beginning; you have the gelatinous plaque and the softening of the enamel. In patients who are usually careful there comes a time when they are a little neglectful, the gelatinous plaque is formed and the enamel softened, and they feel that they have been negligent and they brush regularly and vigorously. The brush and powder wears away the softened enamel and you have an erosion, or rather an abrasion. Those of the other class who are more careless have the gelatinous plaque and the softening of the enamel and breaking down of the enamel and the cavity entering the dentin. If we can prevent this gelatinous plaque from forming we can prevent erosions and caries. A healthy enamel and a healthy gum should withstand all encroachments upon its vitality; the two go together; you cannot long have an inflamed gum and healthy enamel, or unhealthy enamel and a healthy gum. We should train our eyes to detect the slightest thing wrong with the enamel or gum and see the patients often enough to keep both in condition. I would like to lay stress upon having a healthy enamel, and by proper prophylactic treatment we can keep it glossy, smooth and hard. We can take a tooth covered with gelatinous plaque and the enamel softened and bring the enamel back to a healthy condition where it will become so hard that you will find it difficult to scratch it, and a stone in the engine does not make much impression on it. We all understand the polishing of teeth as given by Dr. Smith. We do not need to go into the technique of prophylaxis, but I would like to mention the advantage of the nitrate of silver treatment. By it you can bring the tooth and enamel back to a surprisingly healthy condition. (Case.) By this treatment you prevent erosions. There are exceptions, those peculiar and unaccountable cases that seem to be due to some nervous trouble or some systemic discrasia. These would have to be dealt with as specific cases. Dr. Black thinks that until we know more about them they had better be left and later on put a crown on. I would like to mention a peculiar case that makes me think most of these cases are due to some systemic discrasia.

DR. A. E. WEBSTER.—Mr. President and Gentlemen: I took the pains to bring some erosions with me. Dr. Miller, I think, has said

that most of the erosions are abrasions, and yet there are those cases where they must work together. Many of you have seen the cases where the anterior teeth only are attacked, where at one time the upper incisors occluded naturally with the lowers. Now, when the molars are in contact, the anterior teeth are so wide apart that you could put the little finger freely in between the uppers and lowers. No abrasion on any of the other teeth. There must be, as Dr. Miller has said, some combination of the softening of the tooth structure and at the same time loss by wear. But as Dr. Adams has said, most of the cases which you find are ordinary abrasions with an additional softening. I have here what we know to be mechanical abrasions, because they were all made with a tooth brush. Some of you people and all of the text-books start out with the proposition that these erosions cannot be made in that form with the tooth brush. Now, these on the wire are taken all from the same patient, and they all have what are known as erosions. These on the blocks are taken from erosions made by the tooth brush—with 45,300 strokes of a tooth brush. That one is made from a tooth brush with pumice stone. This one was made with the same brush with prepared chalk. Here is another one with charcoal. I will pass these about so that you can see how nearly the erosions which you find in the mouth are like the erosions which you find made by the brush. Take a look at the manner in which they are cut.

The next point I wish to mention is that many of us do not appreciate the value of nitrate of silver. I believe there are many men practising dentistry to-day who do not use nitrate of silver in their practice at all. It is perhaps one of the most valuable drugs that we find in the dental pharmacopea. Dr. Cook says, in his articles on this subject, and he has studied it carefully, that most of the erosions are secondary to some change in the secretions from the mucous membrane around the neck of the tooth, and that application of nitrate of silver made to the tooth and allowed to get up upon the gum will very often change the secretions and stop the erosion. I saw a clinic at Niagara Falls a few years ago, where Dr. Conrad made an application of 20 per cent. nitrate of silver on a wad of cotton all around the mouth as a preliminary to prophylaxis. He says that in most cases the erosions that we find are due to the softening from the secretions from the mucous membrane and from mechanical abrasions.

Dr. Adams suggests the trimming up and getting angular edges rubbed off and getting the whole tooth smooth. Dr. Cook also suggests potassium iodide applied locally and internally in those cases where the erosions are sensitive. The usual idea is that these are very sensitive. If so, they are usually decayed. That polished surface is really very sensitive, but once having gone through it with the burr it is not so sensitive as it would be if it had been decayed.

Dominion Dental Journal

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All Communications relating to the Business Department of the Journal must be addressed to the **DOMINION DENTAL JOURNAL, 3 College Street, Toronto, Ontario.**

VOL. XXIII

TORONTO, AUGUST 15, 1911

No. 8

THE DENTIST'S DUTY TO HIS PATIENTS AND TO OTHER DENTISTS DURING HOLIDAY SEASON.

Just at this time of year a number of dentists are away from their offices, and as occurs in every practice patients require immediate attention. Such patients seek the services of a dentist known to them or one recommended by some friend. A great many people who are under the regular care of a dentist are away from home just now and may require dental attention. In Canada, as in every country with adequate transportation facilities and increasing population, the people move from place to place as opportunities of betterment present themselves. In their new homes they must seek a new dentist.

What should be the duty of a dentist towards his regular patients while he himself is away from his practice and what

should be his duty to patients who are temporarily away from home, or towards those who are making new homes in some other locality? Another question of equal importance should be the attitude of the dentist towards patients who have sought their services under such circumstances.

In a regular family practice the dentist should by some means have those of his patients who need immediate attention attended at all times. This may be done by an arrangement with a confrerer which has lasted for years, and patients get to know of it, or it may be done by having someone in the office who will make arrangements with other dentists to attend to them. If an office is to be closed an arrangement can be made with the telephone company to have all the calls connected with a confrerer.

If the family dentist should happen to know that his patient is going for a long holiday or long trip, or to live in another locality, it is his duty to give him the name or names of dentists whose services he might need. In many cases it is wise to write the dentist telling him to expect a certain patient or family. There are many reasons why patients should be so referred. They are more likely to receive the kind of services they are accustomed to. The dentist will know whether his patient can afford to pay the fees that may be asked. It often occurs that a young man whose time is not all occupied can give attention to emergency calls better than the older dentist whose time is all engaged.

In the final analysis the reputation of a professional man is made and maintained by those in the same calling. One can readily understand the value it is to a dentist to have his confrerers speak well of him. Not only speak well of him, but recommend their patients to him. Such patients have much more confidence in a dentist so recommended than one consulted without a recommendation. It gives the profession a better standing with the people. It often occurs that a patient is going to a city or town in which there is not a well known dentist. In such cases, consult a directory in which the qualifications of dentists are given.

Johnson says that it is the duty of the dentist, who is consulted by another dentist's patient, to do only those operations which will make the patient comfortable until such time as he may consult his own dentist, and to collect his own fee. To do more than this is not fair dealing.

Editorial Notes

Mrs. Dr. Teetzel, St. Thomas, died July 6th, 1911.

Mrs. R. Bruce Burt, wife of Dr. R. Bruce Burt, of Burlington, Ont., died in Paris, France, August 26th.

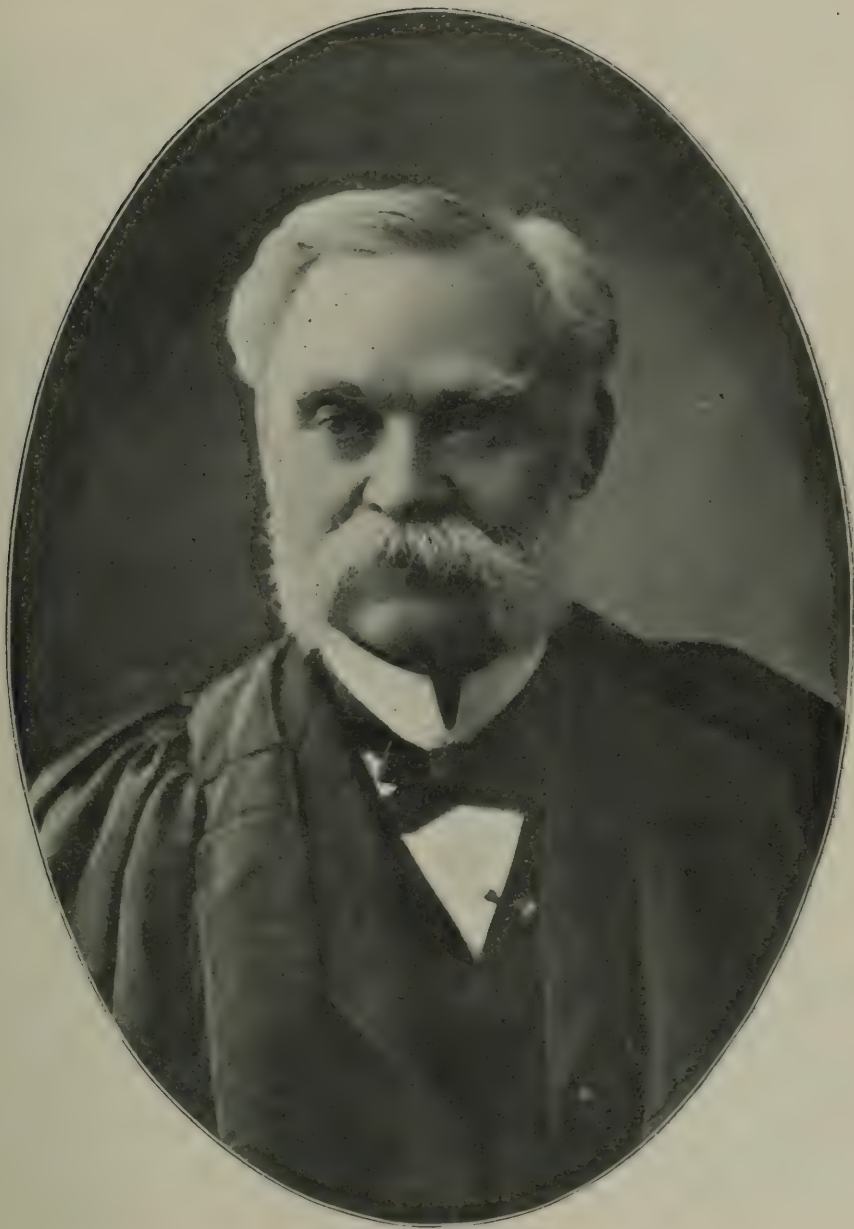
Dr. Robert Meek, Orangeville, died of cerebro spinal meningitis following the extreme heat of early July. A fuller notice will appear later.

The annual picnic of the Hamilton Dental Society was held at Bay View Park on July 6, 1911. The usual sports were run off and a general good time indulged in. Several dentists from Toronto, St. Catharines and other places were present. The baseball game was won by the single men.

Dr. Henry Morgan, Nashville, has been appointed Dean of the Dental Department of Vanderbilt University, to succeed Dr. Stubblefield, who has retired because of ill health.

By some mistake Dr. Croll, of Souris, Man., name did not appear in the July issue of this Journal for having opened the Discussion on Dr. Webster's paper, read before the Dental Society of Western Canada.

Dr. Burgess, a 1911 graduate of the Royal College of Dental Surgeons of Ontario, has accepted the position as assistant to Prof. Weeks, in operative dentistry and crown and bridge work in the Philadelphia Dental College for 1911-12.



DR. J. B. WILLMOTT

Dean of the Royal College of Dental Surgeons of Ontario
who has been recently elected Vice President of the National
Dental Faculties Association of the United States.



DR. DUBEAU

Dean of Laval University, Montreal

who has been elected a member of the Adintrum Committee of the
National Dental Faculties Association of the United States.

Proceedings of Dental Societies

NOVA SCOTIA DENTAL EXAMINING BOARD.

Drs. H. Woodbury, Harrington, A. C. Hooding, M. K. Langille, Geo. K. Thompson, Geo. H. Fluck, F. W. Ryan, F. Woodbury.

OFFICERS OF THE EASTERN ONTARIO DENTAL ASSOCIATION,

President—R. J. Reade, Toronto.
Vice-Pres.—A. J. Morrow, Maxville.
Sec.-Treas.—W. C. McCartney, Ottawa.
Supervisor of Clinics—A. W. Winnett, Kingston.

ELGIN DENTAL SOCIETY.

Reported by H. H. Way, D.D.S.

At the last and closing meeting of this year's activities, the members of the Elgin Dental Society elected the following:—

Dr. E. B. Taylor for President, who followed in a very masterly speech and of which the retiring President, Lumbus, wished him to reduce to writing, but declined.

Dr. Way, re-elected Sec.-Treas.

Dr. E. A. Clark, Vice-Pres., (absent).

The original Educational Committee, of the past year, proving so efficient, were also re-elected. They are Drs. F. E. Bennett, C. C. Lumley and T. C. Trigger.

The Chicago Dental Society has planned for an enormous two-day's celebration on January 22nd and 23rd, 1912. This will be the 48th annual meeting of this Society. We will have clinics on both days and papers read by the best men obtainable in the evenings.

This Society has attained a membership of almost 1,200, and we propose to make this one of the greatest celebrations we have ever attempted.

OFFICERS OF THE NOVA SCOTIA DENTAL ASSOCIATION, 1911-12.

President—Dr. H. W. Black, Halifax.
1st Vice-Pres.—Dr. W. C. Oxner, Halifax.

2nd Vice-Pres.—Dr. Colvin H. Craig, Amherst.

Secretary—Dr. Wm. W. Woodbury, Halifax.

Executive Committee—H. W. Black, Sydney; W. C. Oxner, Halifax; C. H. Craig, Amherst; Wm. D. Woodbury, Halifax; W. H. H. Beckwith, Halifax.

Auditors—Dr. S. G. Ritchie, Dr. R. E. MacDonald.

ALBERTA DENTAL ASSOCIATION.

Reported by Dr. H. F. Whittaker, D.D.S.

The Alberta Dental Association held its annual meeting at Calgary, July 10-11, and was the best attended meeting ever held by the Association. The mornings were given over to business meetings and the afternoons to clinics and papers. The Calgary Dental Club entertained the Association to a banquet on Monday evening.

The Association decided to affiliate with the Alberta University, the University in future to conduct all examinations and pass all credentials. The Association also endorsed the action of the Board in withdrawing from the Dominion Dental Council. This action, however, we expect to be only temporary, as we are asking Legislation at the coming session of the Legislature which, if secured, will warrant Alberta in again becoming an agreeing Province.

The officers elected were:—

President—Dr. A. E. Jamieson, Edmonton.

Vice-Pres.—Dr. H.G. Hoare, Wetaskwin.

Sec.-Treas.—Dr. H.F. Whittaker, Edmonton.

Members of the Board—Drs. A.D. Callum, and E. M. Doyle, both of Calgary.

LAVAL UNIVERSITY SCHOOL OF DENTAL SURGERY.

DOCTORS OF DENTAL SURGERY.

Romulus Lionne, D.D.S., Montreal, Que.;
Albert Delorme, D.D.S., Montreal, Que.;
Victor Mayotte, D.D.S., Montreal, Que.;
Adeodat, Bedard, D.D.S., St. Hyacinthe,

Que ; A. Valmare Oliver, D.D.S., Sherbrooke, Que ; H. E. Cramer, D.D.S., Paris, France ; Z. Berger, M.D., D.D.S., Cerousty, Belgium ; P. S. Cyr, D.D.S., Van Buren, Maine ; J. H. Lamarse, D.D.S., Montreal, Que. ; H.P. Demers, D.D.S. ; H. Frichitto, D.D.S., Quebec, Que.

BACHELORS OF DENTAL SURGERY.

Tancrede Asselin, Rodrigue Charlebois,

Michel Lerome, J.A. Leschenes, Armand Dubord, Martial Fleury, Gustave Grendreau, Arthur Girard, Leopold Larocque, Thomas Lavoie, Lionel Plante, Paul-Emile Poitras, Omer Rajotte, Willie St. Pierre, Honorius Thibault, Arthur Barras, Joseph Beland, Jacques Bourdon, Louis Philippe Boutin, Ernest Herbert Charron, Oliva Cyr, Louis Deguise, Xiste Laberge, Herman LeBon, Leprohon, Victor Levasseur, Arthur Renaud, Joseph Veilleux, Elphege Precourt.

PRELIMINARY AND PROFESSIONAL EDUCATIONAL REQUIREMENTS OF THE PROVINCIAL DENTAL BOARD OF NOVA SCOTIA.

Preliminary Requirements to come in force on and after August 15th, 1911.

Professional Requirements to come in force on and after March 15th, 1911.

Approved by the Governor in Council.

NOTICE.

Under the provisions of "An Act Relating to the Practice of Dentistry" (Chapter 105, R.S. 1900 and subsequent amendments) the Provincial Dental Board of Nova Scotia is empowered to establish, change, or amend from time to time the Standard of Preliminary or Matriculation Examination to be passed by Dental Students, to prescribe the course of study to be pursued and length of such course, final examinations and all other particulars respecting the practice of Dentistry in Nova Scotia. Provided that such curriculum and requirements have been approved by the Governor in Council and by the Association (Chapter, 105, R.S. 1900 Section 11 & 13, Section 17, sub. sec. 2).

In accordance with the above authority, recommendations were made by the Provincial Dental Board and resolutions passed by the Nova Scotia Dental Association at the annual convention held at Sydney, Cape Breton, July 7th & 8th, 1909, authorizing certain changes and amendments to the standards of Preliminary and Professional requirements. The full text was submitted to the Annual Meeting of the Dental Association, held in Halifax, July 14th and 15th 1910, and presented to the Governor-in-Council, August 12th, 1910, and approved.

The professional requirements in these regulations come in force on and after March 15th, 1911. The preliminary educational requirements come in force August 15, 1911. Students who are preparing for matriculation under the present requirements must pass the examination before that date.

The regulations are hereby published for the information and guidance of Dental students and the profession generally, careful perusal is requested.

Throughout these regulations the masculine pronoun is to be read as standing for candidates irrespective of sex.

For dates of examinations and further particulars, apply to George K. Thompson, D.D.S., Sec'y Registrar of Provincial Dental Board, Chronicle Building, Halifax, Nova Scotia.

THE MARITIME DENTAL COLLEGE

This Institution is conducted by the Provincial Dental Board of Nova Scotia. It is affiliated for teaching and examination purposes with Dalhousie University and the Halifax Medical College.

Preliminary and Matriculation Qualifications.

The Maritime Dental College does not conduct Preliminary or Matriculation Examinations.

Before being registered in the Maritime Dental College all intending students from Nova Scotia must present certificates of Board.

Students from other provinces in Canada, or other countries, must present such cer-

matriculation from the Provincial Dental certificates of Preliminary education or Matriculation as are specified and accepted by the Dominion Dental Council of Canada, or by the Province in Canada in which they are regularly registered as Dental students.

DOMINION DENTAL COUNCIL.*

the Dominion Dental Council of Canada, or is a central organization under the control of the dental profession of Canada. Its object is to erect and maintain a standard of education and ethics for the dental profession, and to conduct professional examinations and issue Certificates of Qualification which shall be accepted without further examination by the provinces.

For Calendar and further particulars apply to Frank Woodbury, D.D.S., Dean, 192 Pleasant Street, Halifax, Nova Scotia.

*For information concerning the requirements of the Dominion Dental Council, apply to Dr. W.D. Cowan, Secretary of the Dominion Council Regina, Sask., or to the Dental Registrar of any Province.

QUALIFICATION FOR MATRICULATION OF STUDENTS IN DENTISTRY IN NOVA SCOTIA.

I. A candidate for admission to the Preliminary Examination must give fourteen days notice previous to such examination to the Secretary Registrar of the Dental Board, of his intention to present himself for such examination; produce satisfactory evidence that he has attained his sixteenth year, that he is a person of good character, and has paid a fee of Ten Dollars (\$10.00) to the Secretary Registrar.

II. The Preliminary Examination will embrace the following subjects, viz:—

- (1) English, (a). Language; Grammar, Analysis, Parsing.
(b). Rhetoric and Composition, including an essay on one of several set subjects from prescribed authors.
- (2) Arithmetic. Complete.
- (3) Algebra, Simple Rules; Rules for the treatment of Indices; Surds; Extraction of Square and Cube Root; Equations of the First Degree; Quadratic Equations.

(4) Geometry, Euclid, Books 1, 2 and 3, with easy deductions.

(5) History and Geography, British and Canadian History with questions in General Geography.

(6) Latin, (a) Translation from prescribed books, with questions arising out of these books, and translation of easy passages not taken from these books.

(b) Grammar, including Accidence and Elementary Syntax.

(c) Composition in translation of easy sentences from English into Latin.

(7) One of the following.

Greek, (a) Translation from prescribed books, with questions arising out of these books, and translation of easy passages, not taken from these books

(b) Grammar, including Accidence and Elementary Syntax.

(c) Composition in translation of easy sentences from English into Greek.

French. Translation from prescribed books, with grammar questions limited to the Accidence and easy rules of Syntax, and based upon the passages selected for translation.

German. Translation, Grammar, etc. as under French.*

III. Examinations take place in Halifax twice a year, in the months of May and August. On the same dates local examinations may be held on application at Sydney, Pictou and Yarmouth.*

Candidates taking local examinations are required to pay an additional fee of Two Dollars (2.00).

IV. Unless otherwise specified the books prescribed by the Council of Public Instruction for the course leading to the Grade "B" or High School Junior Examinations are recommended.

V. In order to pass, a candidate must make fifty per cent. of marks in each of the seven subjects as above prescribed. If fifty per cent. be made in all subjects but one, and if in that subject the candidate shall have at least twenty-five per cent., he may thereafter present himself for examination

in that subject alone upon payment of a fee of Two Dollars (\$2.00).

VI. Candidates taking local examinations will be required to pay the usual additional \$2.00 fee for such examination.

VII. A candidate failing in more than one subject, or failing to make twenty-five per cent in any subject will be required to appear again for examination in all subjects. Fee for examination for such case will be Five Dollars (\$5.00), or Seven Dollars (\$7.00), if a local examination be taken.

VIII. Certificates will be issued to successful candidates showing the subjects in which they have passed, and the extent to which their knowledge on these subjects was tested.

*English. Authors for 1911—Shakespeare, Julius-Caesar, Macauley, Addison, Kingsley, Hereward the Wake.

Latin for 1911—Caesar, De Bello, Gallico, Book 1, with Virgil Aeneid, Book 1.

Greek for 1911—Xenophon, Anabasis, Book 1.

French for 1911—Berthon, Specimens of Modern French, Prose omitting 4, 6, and 10 and A. Travers le Canada (Quatrieme Livre de Lecture).

German for 1911—Buckheim, Modern German Reader, Part 1 Complete.

*Dates for Examination, 1st Thursday in May and last Thursday in August.

EXEMPTIONS.

IX. Graduates in Arts or Science of any recognized College or University are not required to submit to this examination provided the candidate shows that he has passed a satisfactory examination in Latin; and in Greek, French and German.

X. The Dental Board will also recognize pro tanto the following examinations:

- (1). The Matriculation or Sessional Examination of any chartered University or College approved by the Board.
- (2). The Final or Graduating Examinations of the Collegiate Schools or Academies directly connected with Acadia University, Wolfville, N.S., Kings University, Windsor, N.S., Mount Allison University, Sackville, N.B.

(3). The entrance examination of the Nova Scotia Barristers Society.

(4). The examinations for Teachers' Licenses, Grade A. or B. Nova Scotia.

(5). The examinations for Junior High School Leaving Certificates for Nova Scotia.

(6). The examinations for Honour, First or Second Class Ordinary Diplomas, as issued by the Prince of Wales College, P.E.I.

(7). The examinations for First or Second Class Teachers' Licenses of Prince Edward Island.

(8). The examinations for First Class, or for Grammar School License of New Brunswick.

(9). The examinations for corresponding Licenses or Leaving Examination Certificates issued by the Education Departments of the other Provinces of Canada and of Newfoundland.

(10). The Matriculation or Preliminary Examination of any Medical Licensing Board or Council authorized by Law in His Majesty's Dominions.

Note. In accepting certificates under the above Sub-section 2-10 inclusive, the same per cent. will be required in each of the seven subjects of the examination specified in Section 2—as may be required by Dalhousie University or the Halifax Medical College.*

*Certificates (except Grade xii) issued by the Education Department of 1911 and subsequent years, a mark of at least 60 per cent. will be required in each subject.

The Dental Board will accept the Matriculation Standard set by the Dominion Dental Council.*

This Preliminary or Matriculation qualification shall come into force August 15th, 1911, but shall not apply to students who have begun their studentship previous to that time.

I—REQUIREMENTS FOR LICENSE TO PRACTICE DENTISTRY IN NOVA SCOTIA.

A candidate for license to practice Dentistry must qualify as follows:

- (a). He must be the full age of twenty-one years.

(b). He must forward to the Secretary Registrar fourteen days before the examination.

(1). A written application for examination, accompanied by a satisfactory certificate of character.

(2). The License fee of Twenty Dollars (\$20.00) must be paid before the examination takes place.

(3). The Matriculation Certificate, Diploma, Class Tickets, and any other vouchers considered necessary.

(4). A written statement from himself and attested certificate from preceptor or preceptors as to length of time in months he was studying under his or their direction. Blanks will be supplied by the Secretary—Registrar for this purpose.

Institutions in Canada recognized by the Dominion Dental Council of Canada for the purposes of matriculation.

Dalhousie University, Matric. Exam. (Arts).

University of Kings College, Matric. Exam. (Arts).

Provincial Medical Board of Nova Scotia, Prelim. Exam.

University of New Brunswick, Matric. Exam. (Arts).

College of Physicians and Surgeons of N. B. Matric. Exam.

University of McGill College, Matric. Exam. (Arts).

College of Phy. and Surg. P.Q. Matric. Exam.

University of Toronto, Matric. Exam. and Departmental Arts Matric. Exam.

Trinity University, Departmental Arts Matric. Exam.

Trinity Medical College, Toronto, Dep. Arts Matric. Exam.

Queens University, Dep. Arts Matric. Ex.

Victoria University, Dep. Arts Matric. Exam.

College of Phy. and Surg. Ontario Dep. Arts Matric. Exam.

Western University of Ontario, Dep. Arts Matric. Exam.

University of Manitoba, Prelim. and Previous Exams.

Newfoundland Medical Board, Prelim. or Matric. Exam.

Prelim. Exam. of, or Matric. into any Institution in Great Britain or Canada recognized for the purpose of Matriculation in Medicine or Dentistry by the General Council of Great Britain.

(5). He shall pass an examination before the Board of examiners on the subjects usually included in a Dental Education, and shall perform operations in the mouth, and give practical evidence of skill in Prosthetic Dentistry which shall be satisfactory to the Board.

(to be continued)

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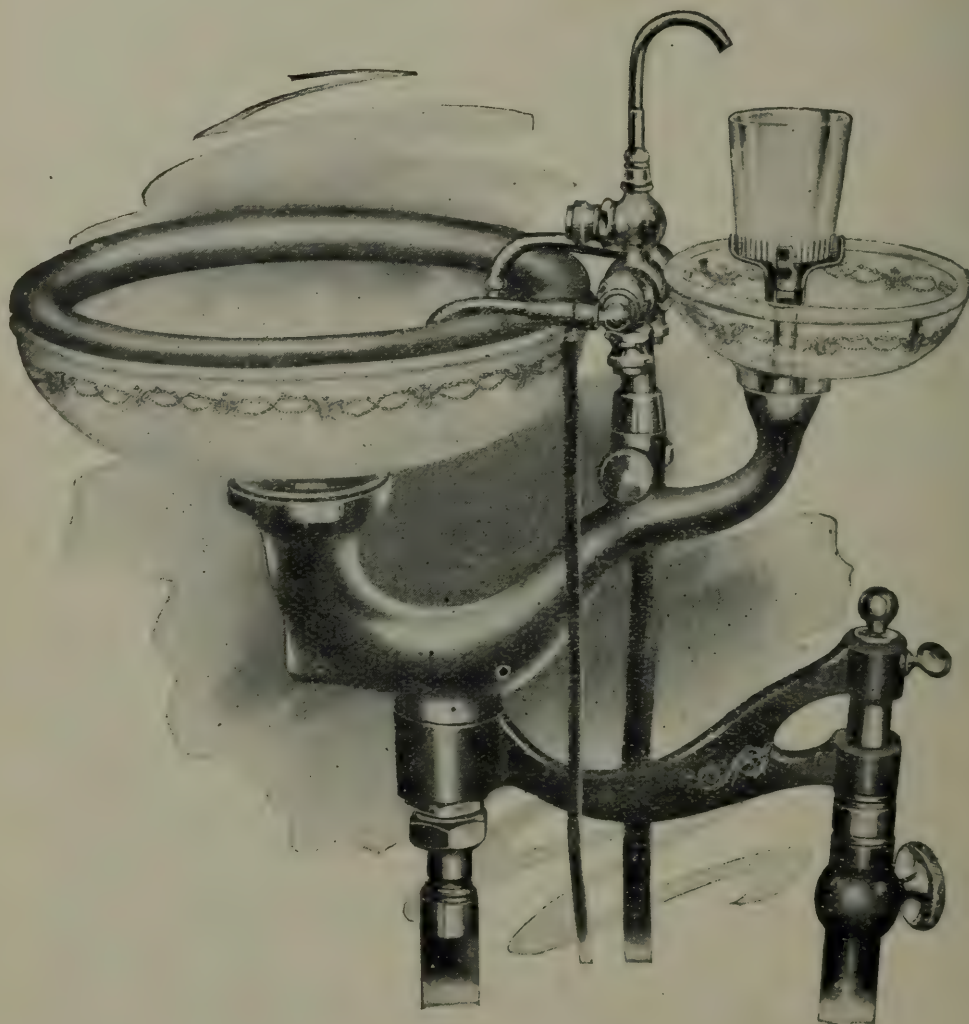
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CHICAGO

Dominion Dental Journal

VOL. XXIII

TORONTO, SEPTEMBER 15, 1911.

No. 9

Original Communications

HUMAN DENTITION AND TEETH FROM THE EVOLUTIONARY AND RACIAL STANDPOINT.*

BY DR. ALES HIRDLIČKA,

Curator of the Division of Physical Anthropology, United States
National Museum, Washington, D.C.

Delivered before the Ontario Dental Society, Toronto, May 31, June 1 and 2, 1911.

Mr. Chairman, Ladies and Gentlemen:

The subject which I have chosen for the address to-night is a very large one, and it will not be possible for me to cover anywhere near its whole extent. I shall, therefore, touch merely upon the principal items of the theme, and try to show how we look at the teeth from the anthropological standpoint in the light of our present knowledge, based especially on the important discoveries which have been made in regard to early man in Europe during the last ten years. I shall speak on the evolution of the human teeth; their evolution in the past, and also on that going on at the present time, adding, if time permits, a few remarks on what may be expected in this line in the future. Then I shall show a few of the racial characteristics and racial differences in denture and dentition, and finally I shall say a few words concerning the pathology of teeth in the different races, and the very limited dentistry that has been witnessed among different primitive peoples. In regard to primitive peoples, I shall confine myself principally to the Indians, because, first of all, they are the nearest such race to us geographically, and, in the second place, because conditions in regard to the teeth found in the Indian reflect largely what is shown by the primitive races in other parts of the world.

As to the *evolution* of the human teeth, we must begin, of course, with the fact that man has evolved at some time in the history of the world from forms that were not human. He evolved not from

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apes, as we know them to-day, but from the midst of some sub-human, or, if you want to speak of it that way, far advanced animal forms; or, giving it more technically, from some ancient primates. What those primates were, when they existed, and where they existed, we do not as yet exactly know. Their actual remains have not as yet been discovered, but we firmly believe that some traces of such primates do exist somewhere in the world. They could not have been few in numbers, and they must have existed for a length of time, for the ascent of man must have long been preparing. That we have not found them as yet should not be discouraging. When you conceive that practically all Africa, nearly the whole of Asia, perhaps nine-tenths of Oceania, and even large parts of Europe are as yet almost untouched by research which could be expected to bring to light such ancient remains, you will understand that practically the whole future in this regard still lies before us. We may, therefore, have full confidence that in the future, perhaps not far distant, skeletal remains of the anthropogenic primate or primates will be discovered.

Now, if man has evolved from more primitive forms, his teeth must naturally also have evolved from forms zoologically more primitive, more animal-like, less than the human; and of these forms we are able to conceive, on the basis of analogies, a fairly definite notion. Take present, as well as extinct, mammals, from the living primates downwards, and you will see that in all the higher forms there is a certain fundamental type of denture; and this type of teeth, so stable in the main under varying conditions, cannot be regarded, in general, as other than the ancient type from which somewhere and at some time the denture that eventually became characteristically human, began to evolve.

I have brought here a few specimens in partial illustration of the remarks just made. They show well that basal type of higher mammal denture which I referred to. There are here the jaws of a typical insectivore, a herbivore, a pachyderm, a feline, a wolf, a bear and of a number of primates. The latter include the jaws of gorilla, chimpanzee, orang, gibbon, and a larger baboon. Now, if you will examine these even superficially and mark the most striking characteristics of the denture (and what is true of the lower jaw is equally applicable to the upper jaw), you will see that outside of the number of the teeth and outside of other features peculiar to the different species, there is throughout these forms, which represent the bulk of the higher mammals, a likeness of type, a fundamental similarity. If we then view this type in a manner more abstract, we perceive that its most striking and constant trait is the prominence of the canines, their pointed nature, and the diastemae in the front, and especially in the rear of these teeth. The diastemae are due to the size of the root of the canine and to that of its alveolus. To these, in the second place, may be added the gen-

erally peculiar form of the first bicuspid or premolar, with its difference from the tooth following; and the equal or larger size of the posterior as compared with the more anterior molars. When we come to the present human form of denture, we find that all these characteristics are to a large extent absent; yet on closer study there are found vestiges of the same which indicate that they once existed in early man or man's precursors, but have been almost completely lost during the progress of the human evolution. We still find in man of this day a canine that is pointed, but it is a canine that does not reach, except to a small extent, beyond the level of the other teeth, and one that is practically never surrounded, followed or preceded by a diastema. We also see the first premolar considerably changed, it has assumed a form that is much like that of the second premolar and is unlike any of those earlier forms that you note here; and the human molars show generally a well-marked diminution in size from before backwards.

Now, from analogies in paleontology and from other biological considerations, it follows that the just-indicate changes in teeth, or those from the communal type of the higher mammal denture to that of the present-day man, must not merely be of ancient origin, but that they must also have taken a great length of time, amounting to many tens of thousands of years, for their development and for reaching the relative stability which they show in the living man all over the globe. There are no means of measuring this time; but the fact that it was of long duration is fully sustained by what is known of the human teeth in antiquity.

That leads us to the evidence offered on the above points by the earliest known human representatives. I have here several casts of human lower jaws of well authenticated geological antiquity, and in these jaws you will find that the above-spoken-of changes, or, in other words, the human characteristics of the teeth, are already quite definitely established. The very earliest remains that exist at this date from a human being is the lower jaw of the so-called man of Heidelberg. The bone was found under 70 feet (24.1 meters) of alluvia and sands, near the village of Mauer, not far from Heidelberg, Germany. This lower jaw, the cast of which is before you, presents such morphological features that in the beginning there were serious doubts as to exactly where to class it. It was finally accepted as belonging to early man, mainly on the basis of the teeth. It is, as you see, large, very massive and extremely primate-like in not only the total absence of the chin, but in the actual slope backward of the symphysis. You will observe that in the chimpanzee jaw which I have here the grade of the backward slope of the chin is not any greater, in fact it is slightly less than it is in the jaw of Heidelberg. You also notice the great and unhuman breadth of the ascending rami in the specimen, and the large dental arch. When you come to examine the teeth, however, you find that, while they are in general very perceptibly

larger than those of the present man, yet the canine is already of the same relative size and form as in the human jaw of to-day; it is entirely in apposition with the neighboring teeth; the first bicuspid has already assumed its human form; and the molars, though with the exception of the third left they all possess as yet five cusps, have changed in size, so that they diminish from before backwards nearly as in modern man. In consequence of these modifications the denture of this being, although the teeth as mentioned are larger and show also some differences of secondary importance from those of the average present man, must be considered as absolutely human. Thus already at the time of the existence of this very primitive being, still anthropoid-like in many important characteristics, the stock developing into man possessed a denture that was quite human like. The existence of the *Homo Heidelbergensis* is placed at the beginning of the quaternary, or in the early part of the glacial epoch in Europe. The distance of time in years can only be guessed at; for as soon as we pass beyond the historic period there is nothing to go by except the earth's strata. I may say, however, that anthropologists are inclined to consider the age of this jaw as 30,000 years or over. So that already 30,000 years ago, as you see, the denture of the beings evolving towards man existed in almost its present human form. The reduction of the canines, first bicuspid and the molars to the form shown by the Heidelberg man, required in all probability a much longer period than that needed for the reduction of the denture such as seen in the Heidelberg man to that of the man of this day.

I have here further specimens, representing two other human beings who were more recent than the Heidelberg man, yet both of whom lived before the present epoch in Europe and are quite ancient. One of the specimens is the cast of a lower jaw belonging to one of the cave men of ancient France (*H. mousteriensis* Hans.). The jaw is still very massive, but the condyles and angles have already assumed a much more human character than they show in the Heidelberg specimen; yet there is still a lock of chin. And here is the cast of another ancient jaw belonging to the so-called Spy man, found in a cave in Belgium. Both the jaw I showed last and this belong to a species of the human family now known as the *Homo primigenius*, whose best-known representative is the so-called skull of Neanderthal, which, however, lacks the jaws. The Spy lower jaw, you observe, is much like the preceding specimen from France and lacks the chin. The teeth in both are almost entirely like those of some of the more primitive races of man of this day.

The specimens here shown and others of similar nature of which we have knowledge, demonstrate that the evolution of teeth towards the present human form was already far advanced in the beginnings of the quaternary, and that at the beginning of the actual or Holocene epoch, it was quite as it is in the less civilized peoples of to-day.

Its earlier stages must extend far back into the Tertiary, into the Pliscene.

When we come to the dawn of historical times we find teeth and also the lower jaw fully as they are now. I have here a number of jaws from the ancient cemeteries in Egypt. Two of these date from the twelfth dynasty, regarded now by the best authorities as beginning nearly four thousand years ago, *i.e.*, two thousand years B.C. I have also examined a series of Egyptian jaws still older, proceeding from the so-called early pre-dynastic period, more than 5,000 and possibly 6,000 years ago. All of these jaws, as those you see here, have a chin, which is occasionally quite prominent; they have lost the other peculiar features that you find in the jaws of the ancient man, are much less massive; and the teeth are entirely modern human in size as well as in form. Not only that, but before this period, before say 6,000 years ago at least, in Egypt, there had already become manifest another step in the evolution of human denture, namely, the beginning of a further reduction in numbers. Already in the most ancient known graves in Egypt there are occasional human jaws in which the third molar or wisdom tooth is rudimentary or wholly (congenitally) eliminated. In the quaternary jaws, so far as we have them represented, there is not as yet a trace of this elimination. The tendency toward the loss of the third molar is evidently an evolutionary feature of the human teeth that belongs to the present era, and in some races of man has as yet scarcely begun to be manifest.

At the time of the predynastic and even the twelfth dynasty Egyptians, the frequency of the elimination of the third molars was not as great as it is to-day in the white man. It was about as it is to-day in some of the primitive races, such as the Indian. In the white man of to-day the elimination of the "wisdom tooth" is, as you well know, common. It may be absent or there may be manifest a diminution in size, irregularity in form, or impaction of one or more of these teeth, and there is no doubt but that this dental element advances in the civilized man towards a more rudimentary condition and more frequent elimination, not unlike the second molars in the felidae, and to final complete loss. And there are already signs that other teeth, such as the lateral incisors, etc., will follow the same route.

These are, in brief, the principal points that I can touch upon regarding the evolution of the human teeth. I should like to go into detail, especially to show how other features, the cusps and roots, have been modified, but that part of the subject must be left for another occasion.

However, there are two very important questions in connection with the evolution of human denture which cannot be passed. They are, *where* and *why* has the evolution of the human teeth taken place. Everyone naturally is interested in knowing something, if possible, about the cradle of humanity; as far as the speaker is concerned

he is quite confident that if we knew where the principal phases of the dental evolution of man took place we should be very near the cradle of humanity. Unfortunately the question as to exactly where this was cannot as yet be answered definitely. It can only be answered by inferences and assumptions, and the present theories may a few years hence require important alterations. However, biologic logic, if I may use that term, leads us to suppose that the dental evolution which led to the present human type has not taken place exactly in those regions in which man's forefathers, the primates from which the first representatives of his species developed, lived, and that for reasons of which I shall speak presently. This is a very important subject, which deserves the close attention of all students of human evolution. The teeth in man, as well as in the animals, are, strictly speaking, only natural tools. They are not equivalent to limbs, but are merely natural implements. They were developed to start with because of certain requirements of the organism which necessitated or made advantageous such epidermal modifications, and they were kept up and further modified only because and according to the special requirements of different families or genera of beings, or of the same family or its parts at different times. If any differentiation in the teeth has taken place among the anthropogenic primates and the earliest representatives of man, there must have been changes in function relating to the teeth, otherwise their modifications would have been at best very irregular, and the ancestral type of teeth would have been preserved to this day. It is only modification of its function, of its uses, that can modify a passive tool-organ such as the tooth, and what could this change in function have been?

The teeth in primates of all times subserved doubtless two classes of usage, namely, offence and defence, and mastication of food. In offence and defence their role, however, was already of far less importance than in many other mammals; it was confined, as we see by present-day analogies, almost exclusively to males, and it diminished still further with the advancing liberation, through the habitual assumption of the erect posture, of the arms and hands, which at first alone and later with the help of sticks or stones, became the principal means of combat. The teeth employed for this purpose were almost exclusively the canines, and the reduction of these teeth to a more human-like form, with the disappearance of the diastemae about them, gradually followed, doubtless, in the main, because of their disuse as weapons. These changes could have become well advanced in the original territory occupied by the primates, from which the stock leading eventually to man developed.

But there were many other important modifications in the denture in the earliest forms of man, or his latest forerunners, which can only be attributed to profound changes in the function of mastication. This refers especially to diminution in the size of the incisors, premolars and molars, and in the second place to changes

in their form. Mastication, however, is connected intimately with the question of food. If the nature of the food had not changed in the primates or the branch of these that led to man, then it seems safe to say there would not have been any development of the human teeth, and, in consequence, no differentiation of the human jaw, of the human skull, and of such a human being in general as now exists. It was only a change in food that could have brought this about, and a change in food at that period in man's history could scarcely have taken place except by change in locality, which in turn could only have been the result of multiplication of numbers and consequent spread of some parts of the man-forming stock to regions that offered or necessitated such changes in food. So far as our reasoning can now reach, it is possible to imagine the process something like this: After a certain family of primates has multiplied excessively, or beyond the possibility of longer co-existing in one centre or region, then parts of that family migrated, and some members of new generations being obliged to repeat this, they or some of them eventually reached territory where the conditions of life and environment, and particularly the food, were different, where there was food that did not require such an exertion, that did not require such power of the teeth for its mastication, as had been the case in the original centre of distribution of that stock; and reduction in functional requirements led gradually to corresponding reduction of the teeth in size and to slow evolution, or rather involution, of all the teeth towards the subsequent human form.

What I have now given to you are, of course, largely only inductions, which, as I said before, may receive important modifications as knowledge accumulates. Yet these expressions are not purely hypothetical, for we have some evidence of such changes and due to such causes as I have spoken of, at the present day. Some of these indications are as follows: When careful measurements are taken of the teeth in hundreds of individuals of the white man it is found that the proportions of the teeth, and especially their relative proportions to the whole arch or jaw or skull, have a certain definite average value, about which, of course, there are grouped numerous individual variations. When we examine the more primitive man in different parts of the world, the man who still needs his teeth more than the white man does on account of the coarser preparation and in some instances larger quantity of the food, we find that the above-mentioned average proportions of the teeth are generally above those of the civilized white man. Not only that, but there is a strong probability that in one or two instances groups of men with an already reduced form of the denture, under new conditions, calling for greater use, have again developed larger teeth, advancing thus really backward in tooth evolution. The best example of this in America is the Eskimo. The Eskimo, we know quite conclusively, are a branch of the yellow or "Mongolic" race, a branch that emigrated into North America long after North America was

peopled. Had this not been the case they would not have stayed in the limited and inhospitable belt in which they are found. They did not choose those bleak, cold regions of their own volition, for they evidently wanted to penetrate time and again lower down and became mortal enemies with all the neighboring Indian tribes, but they were never strong enough to actually effect lasting settlements more southward, except in Alaska and Labrador, and were restricted to the northernmost strip of land and the neighboring islands, which the Indians did not care for. As one result of the confinement to these regions, where there are lack of fuel and increased requirements of food, and where there is frequently an abundance of raw flesh, these people have developed extraordinary powers of digestion and mastication. They eat, as Peary and others have shown almost incredible quantities of raw fish, seal and other meat, and, in addition, they chew skins and other objects for other purposes. As a result, no doubt, of these conditions, the average size of the teeth in the Eskimo is now very perceptibly larger than that in any of the more southern branches of the yellow-brown people that we know, and it is also, of course, larger than in the white man. There is still found in the Eskimo occasionally a rudimentary condition or even an absence of the third molar, but these occurrences are less frequent, so far as we have the material to judge from, than in the Chinese, Indians, or other related ethnic groups. Here then is evidently a fairly clear example of a modification of the teeth towards a more primitive condition, particularly in size, by greater functional use, by more mastication. The teeth of the Eskimo have grown, however, also in other ways functionally more perfect: caries has almost totally disappeared, and there is less tendency towards diminution in number of the cusps of the molars than in the white and even other peoples. And on account of the teeth, the Eskimo jaws, also, have been modified. You will notice from the several examples which I have here how close an approach there is in these Eskimo jaws with those of the later Quaternary man. These modifications are easily explainable. A greater size of the teeth means necessarily a greater dental arch; a greater dental arch in the lower jaw, with the chin-part stationary, means a diminution of the prominence of the chin; and more mastication means a greater development of the muscles of mastication and, secondarily, of the massiveness of the jaw, with a broader, stronger, ascending ramus.

As to the chin, the inferior part of the lower jaw is quite passive, and man, especially the white man, has a pronounced chin to his jaw to-day not because of a growth of chin but mainly because of reduction of the dental arch, which was not attended to an equal degree by reduction of the parts underneath. The inferior or chin portion of the lower jaw has not degenerated, or degenerated but little; it is functional as a supporting part and remained in length, more than the alveolar arch, as it was in older times. The alveolar arch, diminishing gradually further and further, left the lower anterior

part of the horizontal rami, formerly more posterior than the foremost part of the arch, protruding, and this protrusion became shaped into chin. Somewhat similar results are observable to-day in persons of different ages. In the old, where the alveolar arch has been still more reduced through loss of teeth and absorption, there is as a direct result more prominence to the chin. The so-called lantern jaw of the aged is well known to all of you. To return to the Eskimo—we find that the increased activity of the parts concerned in mastication had also a quite marked effect on the form of the face as a whole and even on the vault of the skull. Tracing such conditions as these, which are taking place to-day in some groups of humanity, we are able to largely reconstruct the conditions which have existed in the past, during the transition from the anthropoids to the present man. And here I must necessarily make another digression to repeat and accentuate the fact that when speaking of the primates or anthropoids from which man developed, it is not the apes, anthropoids or primates such as we know this day; man did not develop from the gorilla or chimpanzee or the orang-outang, or gibbon, because these forms are not known to have existed when man's evolution began, and may be even more recent developments from the old primates than he is.

Jaws and teeth such as we saw in the Eskimo are occasionally met with also in other races. Here is a jaw from New Britain, one of the island groups in Melanesia, where the people are very primitive. You observe the large size of the teeth, the corresponding large size of the jaw, the massiveness of the bone, the almost vertical line of the chin, and other features which are the results of great functional activity. The next specimen is a jaw of an Australian, which shows the condition just mentioned in even a better way. And there is the jaw of an American native which, while not so large as the preceding, shows also an almost complete absence of the chin, large teeth and massiveness. All these specimens, even though some may represent merely individual and not tribal or racial conditions, throw much light on the ways and the causes of at least the last phases of the evolution of the human teeth, and of the facial and cranial parts directly or indirectly connected with the teeth and the function of mastication; and all indicate the correctness, in general at least, of the views which I have expressed regarding the causes of the evolution of the human teeth.

To summarize, in a brief manner, the evolution of teeth towards the present human type was occasioned by the gradual abandonment of the use of the canines as weapons; and especially by diminishing requirements on all the teeth due to quality and perhaps also quantity of food, necessitating less mastication. And the evolution of the teeth in the human direction was the cause of evolution, in the same direction, of the jaws, face, and to some extent even the vault of the skull.

As to the evolution of the human denture *at the present time*,

some of the main points are already embodied in the preceding remarks. The changes evidently continue in the same direction; the use still grows less, and the teeth tend consequently towards a still lesser size, lesser numbers and lesser durability. These conditions are responsible for a great many irregularities in position of the teeth and for most of the pathology of the teeth, the gums and the jaws. They are most marked in the highly civilized white man. On the whole, the evolution of the human denture at the present time, and to a large measure in the past, can be regarded as a process of very gradual degeneration.

The above leads to rather gloomy forebodings so far as the human and especially white man's teeth are concerned *for the future*. Very likely the process of less use will not stop; human-kind will not voluntarily go to greater effort in mastication, at least not as a whole; foods will not become coarser, but doubtless be gradually prepared more perfectly. The result can only be that in the future the teeth of the civilized man will be still less resistant than they are to-day, and that the tendency towards congenital elimination of additional dental elements will continue. This will mean smaller jaws, lesser masseter and temporal muscles, and in consequence of the latter a more delicate face, and probably a tendency towards an increase in the breadth of the skull.

A word as to the skull: Smaller temporal muscles, due to less mastication, mean less strain and pressure on the sides of the cranium, and, as the skull grows principally in the direction of the least resistance, which is a very fundamental and definite law in all growth, such a diminution of pressure will probably result in a greater lateral expansion of the vault and hence a broader cranium.

The future of human teeth is therefore not hopeful, and your profession, gentlemen, will doubtless increase in importance. Eventually, after a great many thousands of years, man's jaws may, in fact, become quite edentulous. . . .

I want now to say a few words about the *differences of the denture and dentition in various races*. And it may be stated right from the start that should we eliminate the white race from comparison such differences would be small. With the exception of the size of the teeth, which is greater in some of the primitive peoples than in the civilized whites, and which also differs from one group to another among these races themselves according to their habits, there is but little variation. The type of human denture can be said to be to-day, with a few exceptions, radically everywhere the same. About the greatest of these exceptions concerns the form of the upper permanent incisors, which in one respect are radically different in the Indians from what they are in the whites, negroes, and at least some other races. The upper and particularly median upper permanent incisors of the Indian are, as you will observe in the specimens brought here for your examination, peculiarly and pronouncedly concave on the buccal surface. I call these teeth shovel-

shaped. The condition is seen with especial clearness before the teeth have suffered any wear. I have called attention to this feature in a number of my publications. It is due to an extraordinary development of the lateral borders of the ventral surface of the crown. Sometimes these borders are so developed that they appear as if folded over the sides of the buccal surface of the tooth. They converge upwards, and at the points of convergence there is often seen a more or less rudimentary cusp. At the same time the dorsal surface of the crown is frequently more convex from above downwards than in the whites. This form of an incisor is found only seldom in the white, and, on the other hand, is but very seldom wanting in the Indian. Generally all the four upper incisors will be thus marked, but occasionally the condition is limited to the median incisors.

Other racial differences in the teeth concern the cusps, roots, etc. They have in part been already mentioned in other connections. The white man shows more often a reduction in number of the cusps on the second and third molar than the negro and some other of the primitive races, and more frequently congenital absences of teeth, especially of the third molar. The root and crown of the third molar, and also the roots of the other teeth, are more often reduced in the whites. Finally, irregularities in position and the occurrence of decay are also most common in the white man.

As to racial difference in dentition, *i. e.*, the eruption of the teeth, our knowledge is as yet very defective. However, the white and the Indian have been investigated in this respect. I shall read a few lines based on my own studies of a large series of pure Indian children free from mixture, and you will see how insignificant, with perhaps one exception, the differences in the process of the eruption of the teeth are between the whites and the Indians, two branches of humanity that are so far separated, or seem to be.

The conditions found as a result of the investigation of 960 Apache and Pima children were as follows: All the teeth of the *first dentition* appear in the same order in the Indian children as they do in the white. As to time, the temporary incisors erupt on the average at about the same age in the two races; the appearance of the first temporary molars and the canines seems to be somewhat belated in the Indian; the eruption of the posterior temporary molars and the completion of the first dentition are accomplished earlier in the Indian than in the Caucasian.

As to the *permanent* teeth, the incisors and bicuspids appear at nearly the same period of growth, as indicated by the height of the body² in both races; the canines erupt possibly a little earlier in the Indians; the second molars appear decidedly earlier in the Indians than in whites; and the appearance of the last molars is also probably on the average somewhat earlier than in whites. The earlier eruption of the second and also the third permanent molars, with probably that of the permanent canine, are, in the speaker's opinion,

signs of a somewhat less advanced evolution, as explained before, of the teeth in the Indian than of those in the white people.

Exactly what the conditions regarding dentition may be in other primitive races we do not know, but there are signs that they are in the main as in the Indian. The lack of pronounced racial difference in teeth or dentition indicates strongly a unity of origin of mankind.

As to *anomalous* or *abnormal features of the teeth* in more primitive races I must be very brief. You gentlemen are well acquainted with the anomalies and irregularities of the teeth that are met with in the white man, and I can therefore dispose with all preliminaries. The irregularities and anomalies that are met with in more primitive peoples are largely of the same nature, but many, if not all, are less frequent than in the white man. As to *position*, we find principally crowding, but the crowding of the teeth in the Indian and in other primitive races is rarely pronounced in degree, and almost wholly limited to three varieties, namely, that of the incisors, that of the canines, and the impaction or crowding of the third molars. The crowding of the canine and of the third molar is less frequent than that of the incisors, and the crowding of incisors, which generally results in the displacement of one of them more forward or more backward than it should be is not common and never attains extreme forms. The displacements of the canines in the Indians, are very interesting. Ordinarily the displacement is simply outwards, as also seen frequently in the whites; the eruption of the canine was belated or perhaps the eruption of the neighboring tooth has been a little premature, and the canine in consequence did not find its natural place and erupted on the outside of those teeth. Very rarely the eruption takes place on the inside of the lateral incisor and first premolar. And now and then, in the Indians, the canine is turned more or less completely upside down. We have in the U.S. National Museum 14 examples of this nature; nevertheless the occurrence is rare. In most of the cases only one of the canines is turned, yet the second canine is frequently also affected to a greater or lesser extent. In extreme instances, such as in the skull I now present, both canines are turned completely, so that the root of each projects slightly through the alveolar process or the palate into the buccal cavity, while the crown is seen exposed and pointing upward somewhere near or even in the infraorbital foramen.

Displacements of the bicuspid are generally simple, that is, one of the teeth is more ventrad or dorsad than the other; but even such condition is rare in the Indian and other primitive peoples.

As to the impactions of the third molar, they are quite the same in the Indians and other primitive peoples as in the whites, only, as I said before, much less frequent.

The next to be considered are anomalies of *number*. These consist of defects nearly limited in more primitive man to the third

molar, already referred to, and more properly physiological than abnormal condition; and of excess of dental units, or the so-called supernumerary teeth. The latter are very interesting biologically in many respects, and this is especially true of a certain supernumerary tooth which is found very often in the intermaxillary part of the upper dental arch, in the neighborhood of the incisors. These teeth occur, curiously enough, more frequently in the Indians, especially some tribes, than in the whites; in other more primitive racial groups they seem to be rare. In the Pima children, previously referred to, a little more than 5 per cent. showed one or two such teeth. In most cases the odd tooth was single. These supernumerary dental elements are quite characteristic. Here is one which I drew from a Pima boy. You will note that it is conical and has a short irregular root. A conical crown is almost the rule in these cases, though not always as pronounced as in this specimen. This particular tooth projected from the palate in the neighborhood of the incisive foramen, and in consequence was entirely free from pressure or wear. The significance of these teeth is hard to explain. However, when we go backwards in the zoological line, we find that most of the higher mammals below man and primates possess six incisors, or rather four incisors and two more or less conical sub- or pre-canines, one on each side; and it is possible that these conical supernumerary elements in the intermaxillary which we occasionally find in the Indian, and even in the white man, as well as in other races, are simply reminiscences, imperfect and far away, of the conditions that have existed in past ages in mammals that were the ancestors of the primates.

Rarely a supernumerary bicuspid is seen in the Indian. Here again there is no other plausible explanation at hand except reversion. Then there are occasional supernumerary small dental elements, little points or spiculæ, found next to different teeth in the neighborhood of the molars and bicuspids. They are as a rule functionless, and are probably to be regarded as mere accidents of dentition. Finally we have the so-called fourth molars. There are few cases on record in which apparently a real well-developed fourth molar has been observed. The writer has thus far seen no such personally. In the majority of instances what is called fourth molar is only a rudimentary element comparable more or less to the spiculæ mentioned above, though often stouter, and lying just back or at the side of the third ordinary molar. Some of these elements are larger and deserve more the name of teeth. The presence of the latter is doubtless to be ascribed to reversion. Besides, there are cases, such as I here show you, in which a temporary molar persists to adult life and gives what a superficial observer might easily take for a case of four molars.

Those are in the main the principal anomalies of numbers in the Indian, and I believe I am justified in saying also in the more primitive races.

A word only about anomalies of *form*: they, as seen in the more primitive races, concern in the main the crown, and consist most often of supernumerary cusps, seen with particular frequency on the lateral upper incisors and third molars.

Before leaving the subject of abnormal dentures, I feel that a word should be said about what is frequently regarded by dentists as of other than its real significance. I refer to the form of the dental arch as a whole and to that of the palate which it encloses. The shape of the dental arch and the palate stand largely in correlation with the form of the face and skull. A relatively broad (brachycephalic) skull with broad face will generally and normally be accompanied by a broad dental arch and rather shallow palate, while a relatively narrow skull, with narrow face, such as frequently encountered in England and in this country, will be normally accompanied by a dental arch that is rather narrow and long, and with a high palate. You see typical examples of these conditions in the two specimens now before you, and you may easily satisfy yourselves of their existence, prevalence and absolutely normal character by examining any large cranial collection. They are not due to any individual causes at all; they are not anomalies or abnormalities, and call *per se* for no correction or interference.

In conclusion of this subject I want to show you an arch with teeth such as are very rarely seen among the whites. It is a Sioux skull and represents about as perfect an occlusion of the teeth, with about as perfect a dental arch and set of teeth, as can be found. Such specimens are very rare, even among Indian skulls, for the reason that even if normal conditions of dentition and denture have existed, some of the teeth have in many cases been lost before or after excavation. Out of approximately 11,000 skulls in the National Museum in Washington, I do not think there are 30 in the class with that before you.

The time has advanced, and I shall not trouble you with any further details, but shall merely mention, to round up the subject, a few facts concerning dentistry among the primitive races. It will only be a very few words—because there was really no dentistry. Outside of rare cosmetic inlaying or filing (not filling) of teeth, we do not know as yet of a single instance anywhere in America, or among savages elsewhere, where anything like real dentistry, outside of the extraction or knocking out of the aching tooth, has been practised. And the filing and inlaying has been confined, in this hemisphere, to Central America with adjacent parts. Teeth, generally the upper and especially the median incisors, have been inlaid with polished stones, or even with gold; or they have been filed to a notch or a point. As to extraction of teeth, when the Indians had toothache, and could not bear the pain any more (and the same is apparently true of other primitive people elsewhere, as shown by the records of travellers), the crudest methods, much like those among the least civilized white people, were resorted to, anywhere

from pulling the tooth with a sinew or string to knocking it out with one or two stones. As to caries itself, while it exists among the Indians, and especially in some groups, it exists nowhere in that race—and the same is true of other primitive peoples—with such frequency as among the more cultured whites. Yet in certain regions caries, and especially abscesses, would have afforded plenty of chance for good native dentistry. Instead of that, we see on the skulls that the decay was most often left until the tooth died and was eliminated naturally; and a similar helplessness is generally also evident in regard to other pathological conditions. Here is a lower jaw illustrating these facts. You see marks of inflammation and suppuration about the root of almost every tooth, running its course evidently without any interference. All these remarks may be extended to other primitive groups of man besides the Indian, so far as known.

I conclude, ladies and gentlemen, but shall be very glad, if time permits and as far as I may be able, to answer any questions on points left in the dark; and I also take this opportunity to invite the investigators from your ranks to our laboratory at Washington, where they may study collections the equal of which in many respects are found nowhere else on this continent or in Europe. Those collections are largely as yet undescribed, and the student of teeth will find hundreds of very interesting and scientifically valuable specimens of which I could not give even a mention this evening.

Dr. Green: Ladies and gentlemen, I am sure you will agree with me we have listened to a lecture that has been highly interesting and educational in its nature. Dr. Hrdlicka, instead of satisfying us, has simply stimulated an appetite for more; and I am sure you feel as I do, that we would fain feed longer on those dry bones. However we have some gentlemen here present with us this evening who are intimately and directly interested in this same subject, and I am sure we will be very pleased to hear a few words from those gentlemen. I will be pleased to call on Mr. Corelli to address us for a few minutes.

Mr. Corelli: Mr. Chairman, ladies and gentlemen, I came here rather with the idea that I was merely to move a vote of thanks. I think it is always a pity when a real good lecture has been delivered that the chairman should spoil it. I suffered from that myself once on being asked to deliver a lecture to the plumbers of London. You may not think there is much relation between plumbers and dentists—the bill is something, however. But there was a certain gentleman who spoke for an hour and a half by way of introducing me, and then I had to cut the lecture down to fifteen minutes. This can't be done in this case, but I really cannot detain you by making anything of an address, even if I were capable of doing so. It has been an enormous delight to me, the simplicity and sanity—if I may use the word, with which the subject has been handled; it has been such a very great pleasure; and there have been a number of

things brought forward that are particularly interesting to men in the study of the development of civilization. I was particularly interested in the idea of a change in food and environment bringing about the original change in dentition, which brought about in turn so many other characteristics. I have been wondering, sir, if it were at all possible or probable that the development of weapons had anything to do with that; if the development of man's power to use a weapon—even of using a club or lashing a stone to a club, and so furnishing himself with the first tool—aided at all in giving him another food supply. If that may be so, one may feel hopeful we have something as a basis at last for getting the development of man in his special way away from the other animals.

Now, I have no more that I can say except to express my very, very great thanks for the lecture as it has been given as far as it has affected me, and I feel sure that all those who have listened will feel in the same way. (Applause.)

Dr. Hrdlicka: Mr. Corelli's question can scarcely be answered more definitely than by what was said in the course of this address. Undoubtedly everything that would relieve the being on the road of evolution towards man of using his teeth as weapons, and facilitate his getting and preparing the food, would favor changes in teeth in the direction of the human type. The freeing of his arms and hands, through the assumption of the erect position, was a very important factor; and later on fire and weapons, besides migration, doubtless played their part. Still, I must look upon a change in available food, due to a change of environment, such as could only be brought about by spread or migration, as the main direct early cause of the evolution of the human teeth.

Dr. Green: Will Professor Montgomery be good enough to favor us with a few words?

Professor Montgomery: Mr. Chairman, ladies and gentlemen, I am not going to make any speech at this time of night. I have been asked to say a word or two, not because I have anything important to say, I presume, but for other reasons. It is a good many years ago now since I taught some of these subjects, and I have learned during these thirty or more years that it is quite possible for some people, at any rate, to study—and very devotedly, and sometimes even enthusiastically—some of these subjects, and yet know comparatively little about them. I used to, while residing in some of the Western states, go about lecturing for the university with which I was connected, and often addressed teachers' institutes and other such meetings; and one of my lectures was upon dentition and teeth, and I had with me boxes of numerous skulls, etc.,; and I often thought I made quite an interesting lecture, but I never was sure that a large percentage of the audience thought that. However, I am quite sure to-night we have had a very interesting lecture. I should think probably the chief reason I have been asked to say anything to-night has been that I had the honor and

pleasure for a good many years past of the acquaintance of our eminent lecturer. I have known and had some opportunity of knowing his work in the American Museum of Natural History in New York, and also since he went to the Smithsonian Institution; and there I have had the pleasure of hearing him speak upon the collections of skulls and other skeletal remains to which he has devoted a great deal of attention. I feel that the subject, which is a very specialized and definite one, before us to-night is one full of instruction and interest. There is really not much more to be said—at a meeting of this kind, at any rate—upon it. It is in the hands of a master: one who is an accomplished osteologist. And I want to say one or two other things, in a very few words if I can: one is that his works, published and otherwise, mark an epoch in the study of science upon this continent. Some four or five years ago he was called to make some investigation of the primitive men reported from near Omaha, in Nebraska. His work on that subject alone is so full of illumination, so very clear, so very practical, and so satisfactory, that attention has been called to Dr. Hrdlicka's work ever since—more than even before. Some 15 or 16 years ago I had the honor of addressing the gentlemen at a dental college banquet in the old Rossin House, on King Street. I was the representative of a college here. There were many distinguished gentlemen there, representatives of the Health Department of the Government, of the Education Department of the Province, and of various institutions of learning. I had the boldness in my few remarks to advocate some practical dentistry in connection with the schools of the city of Toronto. The Mayor of the city of Toronto spoke there, and so did these other gentlemen. I was rather discouraged by the smiles and various remarks of almost all of them except the members of the dental profession. I feel that the applause and encouragement which they gave upon that occasion has had something to do with partially awakening the city of Toronto, or those employed in the education of the youth of the city. There has been a long time elapsed, but the time has come when they are partially awakened and some attention is given to the examination of the mouths and health of the school children in this large city. Now, when I learned yesterday for the first time that the Dental Association was bringing Dr. Hrdlicka from Washington to address a public meeting here in Toronto on this scientific subject—it is not altogether a purely bread-and-butter aspect of the subject—I felt and remarked that the heads of the dental profession here were progressive and enterprising. I feel to-night, Mr. Chairman, that these things have a very useful and beneficial influence, and I want to simply record my appreciation and approval of them. I am glad and thankful to have had the opportunity to say a word or two because of these things on two aspects of the work which you have in hand, and I thank you for the opportunity of making these remarks. (Applause.)

Dr. Green: We would be very pleased now to hear a few words from Professor Ramsey Wright. (Applause.)

Professor Ramsey Wright: Mr. President, you have listened to so many admirable addresses to-night that it appears hardly necessary I should add to the number. I think, however, that it is my duty to express the thanks of the guests here to you, Mr. President, and to the Dental Association, for giving us, your guests, the opportunity of hearing this very admirable lecture of Dr. Hrdlicka's. I do not think there is any more interesting chapter in the evolution of vertebrates than that of the development of their teeth. The teeth being so resistant in their structure—more so than the ordinary bones—are to be found when everything else has disappeared; and we are able to study, therefore, from the earlier time when the whole of the surface of the body was covered with teeth as well as the interior of the mouth, and then going on to the higher forms where we find that those skin teeth disappeared and simply left the teeth covering the inside of the mouth, until we go on further and find these teeth are eventually restricted to the surface of the jaws or perhaps in various rows, and then coming up as far as the crocodiles where four or five rows still exist but are coned into each other still in a very useful way—in such a way that when one is carried off there is another one ready to step into its place, until we come to *the* mammals where there were two rows of teeth present—two rows of teeth that came in at different times, unfortunately—and, unfortunately, those extra rows which are present in the lower forms are not placed so that when we lose one of our permanent teeth we can expect one of those auxiliary ones to step in, which Dr. Hrdlicka has suggested might possibly be a remnant of one of those original additional rows; and then after the two rows are disposed of we have to eventually apply to the Dental Association for artificial ones. Dr. Hrdlicka referred to the circumstance that we must look forward eventually to humanity being toothless, or nearly so. That is quite justified from the experiences of the other forms of life; because, if we look at the history of those forms—like the birds and turtles and whales, which are the toothless forms of the present day—we find they have always been descended from forms well provided with teeth. However, we have a long while to look forward to what Dr. Hrdlicka has promised; humanity will for several thousands of years enjoy its two sets of teeth; so that we have not anything to fear with regard to the early failure of humanity in this way.

I wish to thank you again on behalf of the guests for your invitation to be present here to-night, and I wish to support the vote of thanks to Dr. Hrdlicka for his exceedingly interesting lecture. (Applause.)

Professor J. J. MacKenzie. I may say when I received the call of the Ontario Dental Society inviting me to be present at this address I was delighted. I had known of Dr. Hrdlicka's work, and

come under our care in such a manner that those children will grow up with normal alveolar processes and proper occlusion. (Applause.)

Dr. Green: Ladies and gentlemen, you have heard the vote of thanks proposed by Mr. Corelli and so ably supported by the other gentlemen for this able lecture we have heard this evening. What is your pleasure? (Carried with applause.)

Dr. Hrdlicka, I have great pleasure in presenting you with this vote of thanks from this audience; and, further, I would wish to thank you on behalf of the Dental Association of Ontario for your kind invitation down to Washington, and I would ask you to prepare yourself for a northern invasion.

Dr. Hrdlicka: It is certainly a pleasure to speak not merely to an appreciative audience, but to an understanding audience such as I find to-day, and I only regret that my presentation of the subject is so imperfect. However, like in other branches of science, we are far from a complete knowledge of the facts, and must await developments. I thank you very much for your courtesy and attention.

This closed the convention.

REMOVABLE AND SEMI-REMOVABLE BRIDGE WORK.

BY F. L. FOSSUME, D.D.S., NEW YORK.

Read before the Ontario Dental Society, Toronto, May 31st, June 1 and 2, 1911.

When in March I received an invitation from Dr. McDonagh, the chairman of your Executive Committee, to address you at this annual meeting, I was both pleased and perplexed; pleased at the prospect of meeting again so many of my friends in the Dominion—old friends—and of making, I hope, new friends; and perplexed because I did not quite see how the invitation could be accepted, in view of professional engagements demanding my time well into June. However, there are other bridges than those with which we are specially concerned this evening; and I have managed to bridge that little difficulty of absence of time, and to cross—not the Rubicon, but the Niagara River, in order to avail myself of the privilege of addressing you upon a subject which is very near to my heart, and which, in connection with my extensive work on pyorrhea alveolaris, I have had to consider with much care, enabling me to reach quite definite conclusions.

It is a subject, one need scarcely state, that demands trained interest; it involves skill—artistic and mechanical skill—of a high order; and that is why I have purposely selected it, because—as I wrote to your chairman—I feel that you are a progressive and scientific body of dental men, who will not be content with outmoded or imperfect methods, but are always looking keenly for any discoveries or improvements which will carry to a still higher

came with the greatest pleasure to listen to it; and I wish to add my support to Professor Ramsey Wright's remarks, and my personal thanks for being allowed to be present. Some of my old students, I have no doubt, are present here to whom I gave lectures on comparative dental anatomy, and heard some of the things which I told them; but they also heard a great many things which I didn't know anything about when I was teaching them, and put in a manner so clear and so beautiful that I am sure if they had received lectures like that there would have been no plucking at the examinations. (Applause.)

Dr. Fossume: Before this discussion closes I would like to make a few remarks on this subject from the viewpoint of the orthodontist. We as dental surgeons of course are not alone engaged in filling the teeth which are affected by caries; but more especially so, probably, in this latter day of looking into and seeing that the teeth of the young that come under our care are properly developed in their normal positions and relations to one another in occlusion.

Here to-night we have been given conclusive proof that the position of the teeth is due to the stress and work that is put upon them. Now, as orthodontists we cannot look in the human mouth and see the malposition of the tooth as merely a malposition of any individual tooth, but from the viewpoint of lack of growth and development of the parts that support the teeth in the jaws. Now, these parts are so correlated to one another that probably in the growing youth of the child the function most affected by an undeveloped or under-developed dental arch is respiration; the narrow, high palate, being the palatal bone, being also the cross-bones forming the nose, causing the constriction of the interior nerves, causing a deflection of the centre of the nose; and if this is permitted to go on the posterior part of the nerves are greatly affected, and, as you all know, then they have tonsillar trouble, sore throat, adenoids, etc. We have had abundant proof that in expanding the dental arches, and thus stimulating the growth of the maxillary bones and the alveolar processes so that the teeth may adjust themselves or be adjusted into the normal position in the arches and be also adjusted so that their normal relation with one another in the two jaws would produce normal respiration, would insure the normal relation of the mandible to the superior maxilla, and so would cause the natural, or almost what you might say involuntary, closing of the mouth without any abnormal mouth breathing, and so would establish normal respiration; and as dental surgeons there can be nothing of greater importance to us than to obtain the proof that we have to-night through the untiring work of the true scientist upon the human jaws. Specimens that prove for centuries what we are trying to accomplish to-day due to the lack of use of these organs—a natural lack of use—is diminishing the organs in size and strength. For this reason I believe that every one of us will probably go home to-night with a resolution to attend to all those children who may

stage the already high standard of the majority of our profession.

And now I must confine myself more definitely to my subject, which is "Removable and Semi-Removable Bridge Work." I am particularly concerned with three principles, which may be called briefly, the "stationary bar," the "T-piece," and the "semi-removable." These will be taken up succinctly, commencing with the stationary bar, which will be new, I believe, to many of you. And here I must mention that the construction of crowns, inlays, etc., used as attachments will not be considered now, for the numerous principles governing such work are not included in my present subject, since the present problems which can only be treated adequately in a complete and separate essay.

The fundamental requirements of all bridge work are, of course, utility, aesthetic appearance, and cleanliness. The requirement of utility is fulfilled by stationary work; satisfactory appearance often cannot be obtained without the restoration of contour to the alveolar process and to lips and cheek by artificial gum tissue; and then the third requirement, that of cleanliness, necessitates removable bridge work.

All who have had any experience in constructing removable bridge work know well that this is by far the most difficult of all bridge work. The average removable bridge, however well made, does not support properly the natural abutments to which it is fastened, but causes so great a strain upon them that the permanence and utility of the bridge is invariably jeopardized by the abutments becoming loosened or gradually forced from their true position. The slight but increasing movement of the bridge which then occurs during mastication further weakens the supports.

To strengthen supports which would otherwise be insecure or almost helpless, and to combine aesthetic appearance and cleanliness with utility and stability is a problem to which many of our leading bridge workers have devoted—and are still doing so—much time and thought. By using the bar principle of intersupport, I believe that I have practically perfected a system of removable bridge work which secures the fulfilment of all requirements in the highest possible number of cases.

The removable lower left bridge which I am now showing you has two unique features. First: the abutments are united as in a stationary bridge, and consequently support each other equally well. Second: the removable bridge piece is securely locked in place posteriorly. It is needless to give you a detailed technical description of the construction, for the mere appearance shows its simplicity; so I will confine myself to a very brief description of the steps taken. A gold shell cap is constructed on the posterior abutment. The anterior, which embraces the cuspid, is devitalized and a stout oval platinum iridium post inserted in the canal, pure gold being burnished over the lingual and distal surface of the tooth and reinforced with clasp metal and 22 karat gold solder. These are placed on the abutments and a plaster impression taken. When

the model is obtained with the attachment in place the square platinum iridium bar, 14 gauge, is carefully fitted on the ridge, reaching from one attachment to the other. A strip of writing paper is laid on the ridge and the bar adjusted over this and waxed in its place between the attachments. The paper, of course, is placed between the ridge and the bar so that the latter shall not rest upon the mucous membrane and irritate it. The bar is now soldered to the abutments and the piece placed in the mouth and another impression taken. From this model a metal die is made, and on this the platinum saddle forming the base of the removable bridge is swedged up. Rather thin platinum—about 34 gauge—should be used, and the whole of the part over the bar should be heavily reinforced with loops of clasp metal and 18 karat solder, or the saddle will spread under pressure and the bridge will become loose. This saddle can also be made in sheet wax and then cast. Always remember to vaseline the attachments on which you wish to make wax models for castings, so that the models may be withdrawn without being distorted.

To keep the bridge in place a small ledge or shoulder is soldered to the posterior attachment at the mesio-occlusal angle; this shelf engages the posterior part of the saddle as this is slid into place and prevents it from slipping up. Anteriorly the bridge is held in place by one gold clasp, which clasps the gold backing on the cuspid, this having a small rotundity on its centre, over which the clamp snaps gently into place. The bridge is removed by a strong pull up at this point, and as soon as the clasp is over the little gold nob it is also pulled slightly forward.

Very frequently, of course, the abutments for this kind of removable bridge work are not parallel, thus preventing the insertion of the attachments connected by the bar. In such instances I simply solder the bar to the attachment on the more upright tooth, and employ on the other end of the bar the mortise attachment which will be described later, in connection with the semi-removable bridge work.

You will see the simplicity of the whole of this construction and the absolute certainty with which these principles meet the requirements. The keystone is the stationary bar. It remains in the mouth when the bridge is removed, connecting the attachments on the piers, and thus holding these firmly in place, preventing any dislocation and giving a solid foundation to the removable piece. This applies to any bridge which is to be so constructed. There are, of course, many variations where it can be used, from a one-tooth bridge to one including the entire fourteen teeth; but all are necessarily based on the solid bar which connects the attachments on the abutments. There is no rocking or instability of any kind when the removable bridge is accurately made; the abutments are firmly joined and braced in mutual support, and the bridge has a rigid, stable seat.

THE T-PIECE.

I will now, with your kind attention, explain my method of inserting lower back teeth when there are no posterior abutments to which to fasten a bridge. Let us assume, for instance, that there are eight anterior teeth left, as on the model which was shown to you—four incisor, two cuspids, and two first bicuspid. In such cases I employ what is known among my friends in New York as the Fossum T-pieces.

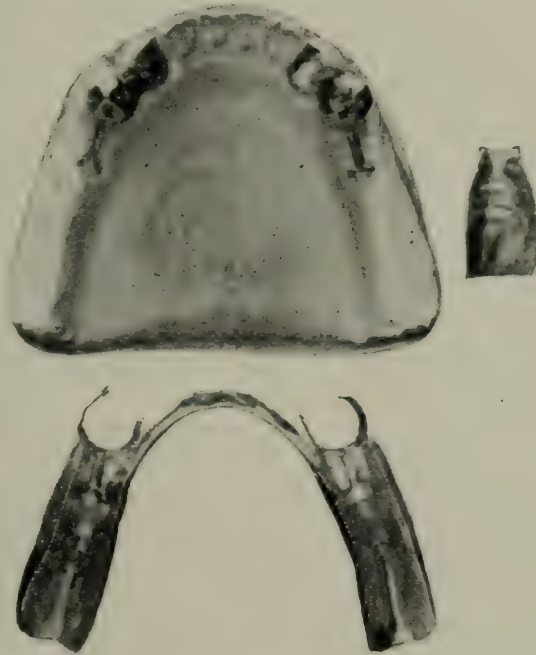


Figure 1

Now let us assume that this case is a duplicate of one inserted in the mouth of a patient who had worn a gold plate for several years. The clamps on this plate had caused the erosion of the enamel and deep decay in the two bicuspid, so that they had to be devitalized and crowned; and as the cuspids were also badly decayed and discolored the natural crowns were cut off and Richmond crowns substituted. The first bicuspid being quite loose, the gold crowns put over them were soldered to the Richmond cuspid crowns, in order to secure greater support. These were now placed in the mouth and an impression taken of each side. When the models were finished, two short attachments were constructed from a square platinum iridium wire about 14 gauge, each attachment being in the form of a T-piece, consisting of two short sections of wire, about three-eighths of an inch in length, one section being soldered at right angles to the centre of the other. These T-pieces are then fitted to the neck of the distal surfaces of the two bicuspid crowns, a strip of writing paper being used, as in the case of the stationary bar, to prevent irritation of the mucous membrane, which would otherwise usually become so hypertrophied as to cover the T-piece entirely. It is also necessary to reinforce the gold crowns, or the T-piece will bend the gold away from the tooth and

become displaced through the stress upon it. This being completed, they are again placed in the mouth and a new impression taken. Another model having been made with the attachments in place, saddles of platinum about 34 gauge are swedged up or cast in gold, fitting accurately over the T-pieces. A bar is now constructed to run lingually below the gingival margin of the anterior teeth and connect the two saddles; this is waxed in place and soldered to the saddles, which must be well reinforced, especially that part covering the T-pieces, or the thin platinum will soon tear. Clamps or other means for holding the piece firmly in position should be soldered in place at the same time. The teeth are now ground in and vulcanized on. Of course, several trials in the mouth may be necessary, and the connecting bar must be of sufficient strength to withstand the stress to which the piece may be subjected.

I sincerely trust that you will all try this method of inserting lower back teeth, which are usually so difficult to make satisfactorily. It has been used by myself and several colleagues in New York with complete success, not a single failure having occurred within my experience.

SEMI-REMOVABLE BRIDGES.

Very frequently, as you know, teeth which are to be used for abutments in bridge work tip considerably, so that great difficulty is encountered when the finished bridge is to be set in place, since the attachments for these malposed teeth cannot be pushed home on both teeth at the same time. Much grinding has to be done on the abutments as well as on the attachments and the original and perfect fit is often destroyed. I must say here that on general principles I object strongly to the extravagant sacrifice of tooth substance when constructing bridge attachments, and I invariably, use half shell crowns, that is, the band runs only half way towards the neck, on well-formed long molars. Attachments can always be made; but when an abutment is lost nothing can bring it back.

The method I employ to establish parallel attachments for a bridge on teeth that are tipped is quite simple. It is based on the

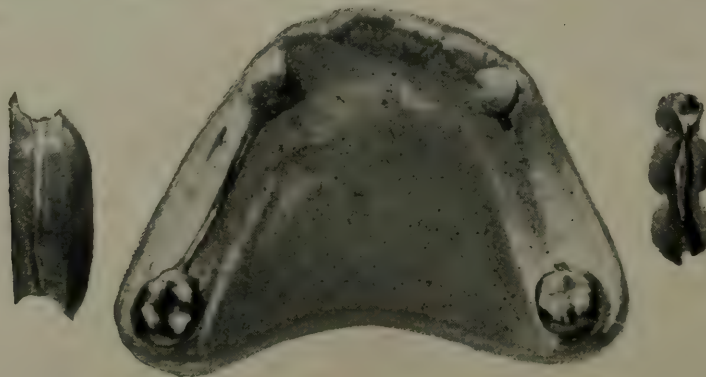


Figure 2

powerful locking principle known as the mortise and tenon. Fig 2. The attachments on the abutments to carry the bridge may be gold

inlays reinforced with platinum iridium pins, or one of the various forms of crowns. When they have been constructed and placed in position on the abutments, the bite and a plaster impression are taken. After the model, with attachment in place, has been made and placed in the articulator, measure with a pair of calipers the length of the bite and cut two lengths of platinum iridium wire, gauge 14, corresponding to this distance, minus three millimeters. The ends of these are ground flat, and they are then adjusted parallel with each other on each attachment on the approximating sides, running from the gingival margin to within about three millimeters of the occlusion. This will permit the bridge to cover them on the occlusal surface and make a close adjustment to the abutment. They should then be waxed in position parallel with each other, a pair of parallelling pliers being used. An investment of sand and plaster is now carefully adjusted around these paralleled pieces and the attachments to which they are waxed. When this investment is set, burn away the hard wax, apply flux and join them together with gold solder.

The next step is to undercut the platinum iridium lugs by grinding grooves, as shown on the model, with a thin carborundum stone. The corresponding mortise may be modelled in wax, over these tenons, as part of the bridge, and cast in one piece, or we may cast separate mortises to each tenon and then make the bridge, and unite all the sections when perfectly adjusted either by casting or soldering.

It is often only necessary to use the mortise and tenon attachment on one abutment, soldering the bridge directly to the other.

Whenever it seems likely that the bridge may have to be removed at some subsequent time, I cement it in position with pink base-plate guttapercha; but where there is only one mortise-attachment and there will be no necessity for removal, I use the same cement as in setting stationary bridges.

The models which you saw at the clinic illustrate clearly all the mechanical principles involved. I have used these principles in my practice for many years, and I think you will find that no other

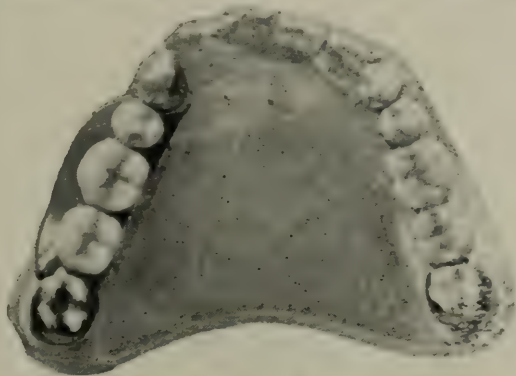


Figure 3

methods give such satisfactory results, viz., simplicity of construction, durability and neatness.

And now, in conclusion, let me say that it is no simple or easy road that one must travel by, to be an idealist in bridge work. It is certainly very difficult to construct bridge work that is as skilfully fashioned as fine jewelery, and yet is strong enough to stand the wear and tear of regular use, while also furnishing an artistic substitute for nature's own beautiful effects, when the teeth and gums are perfect. And you must remember, too, that this work is not fully understood by the general public; so that it is difficult for them to appreciate the time and skill required to produce it. For this reason it is well to explain to the patient as far as possible what the work will mean, and what it will cost.

Conditions in dentistry have changed rapidly during the last few years, and they are still changing. Conservation and prophylaxis are now the watchword, and we are able to overcome difficulties that a little while ago seemed very perplexing, and we are becoming more and more familiar with types of highly skilled work that were scarcely attempted until quite recently, and I hope we shall go on and improve our work of conservation so that very soon the extraction of a permanent tooth will be an unusual operation, for none realizes better than I that all attempts on our part to equal the marvellous works true to the first Maker, are but poor counterfeits.

Mr. President and Gentlemen, I thank you for the patience with which you have listened to this address.

DISCUSSION.

Dr. Fossum: Members of the Ontario Dental Society, Ladies and Gentlemen: I had hoped to have had an opportunity to show you the models which I have brought to illustrate my paper, so that you would have had an opportunity to examine the principles that I employ in making these bridges before listening to the paper. Any mechanical paper is necessarily highly technical, and it is difficult to clearly understand the ideas clothed in words without models with which to illustrate the description.

I do not believe the models should be passed around now, because the bridges fit very snugly on the attachments, and can only be removed in a certain manner; furthermore the light is rather poor in this room, and you would not be able to see perfectly.

Dr. Doherty: Mr. President and Gentlemen: The discussion of this excellent and carefully prepared paper was to be opened by Dr. A. W. Thornton, of Toronto. Dr. Thornton called me by phone yesterday and asked me to explain to the meeting his absence here to-night. Dr. Thornton has been honored and the Society has been honored in his being invited to address the graduating class at the Chicago College of Dentists, and in the evening he is to respond to a toast at a banquet on "Reciprocity." I am sure in both of these he will not only do honor to himself, but to this Society and to the Province which he represents.

As far as any discussion of the paper is concerned there is very

little that I would wish to add to what has been said by one so eminently qualified to discuss this question. There is one point I would like to emphasize, and my own experience has been with fixed bridge work, I have never had occasion to take off a fixed bridge, no matter by whom it was made or worn, that the bridge was not dirty, and at the present time when we are preaching oral hygiene, and rather strenuously, it seems to me this is a question that should be very seriously considered by the dental profession, and I feel that in a great many cases some such appliance as Dr. Fossum has outlined to-night is infinitely superior to any fixed bridge, both from the standpoint of an appliance and from the standpoint of cleanliness. I wish to express to Dr. Fossum my personal appreciation of his paper and to congratulate the Society on this very excellent contribution to the programme.

Dr. Trotter: I have had a great deal of pleasure in listening to Dr. Fossum's paper. I am sorry I have not had an opportunity of seeing some of his models, as I would then feel more in a position to discuss the subject, as I am not accustomed to that method of inserting bridges. I have read considerably about it, and I should think it is a method that has some very strong points in its favor. The longer I am in practice the more and more I become convinced that for the sake of cleanliness removable bridges are becoming more and more desirable. I would like to have Dr. Fossum's opinion on some of the methods that have been more in vogue recently for removable bridge work; that is the different attachments that are on the market, the Roache and Morgan attachments; and give us an idea of his comparison of the two methods, of the weaknesses or strengths of the different methods. As far as the desirability of cleanliness I don't think there is any doubt but what it is in favor of Dr. Fossum's method. I should imagine that in his description of replacing the posterior teeth in the lower jaw there would be a tendency in time for those bars to sink into the soft tissues. I should think that the continual wearing of the removable bridge in time would tilt the bars into the soft tissues, but that may be owing to my ignorance of the method in not having used it.

Dr. McDonagh: Mr. President and Gentlemen: I am sure I haven't any right to speak on the subject, but I would ask you to bear with me. Since Dr. Fossum mentioned my name, possibly I will be permitted to say a word. I have not made any bridges for the last five or six years, as you know, but I have had the opportunity of examining Dr. Fossum's models this afternoon, and I used to know something about bridge work, so it brought it back to me to a certain extent. The bar method which Dr. Fossum is showing in his model, the attaching of the two abutments by a bar, I think is a splendid idea. I used to use it when I was in general practice, and I was very much pleased with the results; but Dr. Fossum has improved on the method that I used at that time, and he has a

bridge there which is an advantage over anything I ever used and anything I have ever seen used, inasmuch as the bridge is fastened to the bar in such a way that the action in masticating the food will not raise it off the bar. But if that bar is as I understand it to keep the abutments in a healthy condition, if you use a removable bridge where the two abutments are standing separate, the movement of the bridge will have an irritating effect on those abutments; and very often in a case where the roots are weak or have been to a certain extent weakened by what is usually called pyorrhœa, the motion or stress is too much for them; whereas by fastening together those two abutments by this bar and allowing the gum to take part of the load you accomplish, a result that it is not possible to get in any other way. Looking at Dr. Fossume's models with the T apparatus attached to them for the replacement of the posterior teeth where it would be impossible to insert a bridge my judgment would be it would not be successful. Dr. Fossume says it is successful. With that bridge he shows you I have no doubt it is successful, because he uses two abutments to hold the teeth. That is, he joins the two teeth together and he adds to those two teeth this apparatus which is intended to hold the little plate or removable bridge which he calls a T; it is in the shape of a T; and by doing that he avoids the leverage he otherwise would have. Dr. Fossume says he uses it on single teeth and he has no trouble. I would not expect he would have success by using it on single teeth. As far as Dr. Trotter's objection goes, the way Dr. Fossume makes his bridge or plate or whatever you like to call it, there is no chance of that T sinking into the gum; when he has that raised probably one millimetre or perhaps more away from the gum tissue the tendency is for the tooth to rise out of the socket and not to sink down into the socket through that leverage motion.

I want to compliment Dr. Fossume on the very excellent paper he has given and for so much description of the technique. It is a very difficult thing to explain to an audience just what you intend when you are explaining a mechanical operation, and I think Dr. Fossume has done a great deal to enlighten us. I want to say also that the ones I have seen are beautifully made, and he is certainly an expert along mechanical lines, and we are very thankful to him for spending his time. I know his time is valuable. When I was in New York I heard of Dr. Fossume as being one of the high-toned dentists of New York, and he has always a great value placed upon his time, so that we should thank Dr. Fossume for coming here and helping us out on this occasion. (Applause.)

Dr. Mallory: I think it would be well if some of the gentlemen who have seen the models would draw them on the board.

Dr. Day: As Dr. Fossume says, it is hard for us to understand his paper without having seen the models. Probably there is no subject that we are as much interested in as this removable crown and bridge work, and that being the case it seems too bad that we

are not in a position to discuss it, and I was wondering if we could not postpone this discussion until after we have seen the models to-morrow. It seems a pity to let such a good paper go without that proper discussion.

Dr. Bennett: I think that can be done very well by drawings. I have seen the models myself. I know those present can't appreciate the value of the paper nearly as much as if they would see the work; it is really beautiful; I think it could be illustrated with drawings.

The President: It does not seem feasible that these drawings can be made so that they will be of very much benefit, and in lieu of that I would suggest that at the clinic to-morrow Dr. Fossum will be able to describe this to the members of the Society. In that case, if there is no further discussion, I will call upon Dr. Fossum to close the discussion, but I would like to announce before calling on him that there is some important business that we have left over from this afternoon until we had a larger audience that we would like to have settled this evening, and I would ask the members to remain in their seats for a little while to get through with this business and be able to go on with our programme to-morrow.

Dr. Fossum: Gentlemen, I sincerely regret that all of you did not have a chance to see the models and examine the principles carefully, because I fully appreciate the impossibility to understand mechanical principles from a descriptive reading. But inasmuch as you still have two days devoted to this meeting, I will suggest that I give two clinics and show you the models in the morning and also on Friday. (Applause.) I have worked several years in perfecting these principles, and I have found them to be right. However, as my paper did not touch upon stationary bridge work, I wish to say that I am not a removable bridge crank, on the contrary, I make stationary bridges whenever possible, that is, provided I can obtain artistic effect and the piece can be kept clean.

Regarding the tipping of the T. pieces which are soldered to the attachments at the neck of the tooth, you need have no fear, for if the occlusion is correct and the saddle of the removable piece rests firmly on the alveolar ridge, the leverage upon the tooth serving as an abutment is not very great; on the model that I have brought the T pieces are a little too long; and in the paper you will remember that I said they should be $\frac{3}{8}$ ths of an inch in length.

Other attachments for removable bridges have also been mentioned, and among them my friend, Dr. Roache's, of Chicago. I don't like his because it permits too much play. Dovetailing and interlocking are based on the straight line and the undercut, and all steel construction and woodwork are made on this same principle, square fittings on the T principle permits no rocking, no pulling away and sliding off; and they are simple and easy to construct, and can be made by anybody. I shall be very glad to answer any questions you may wish to ask.

Dr. Trotter: What method do you adopt where there are intervening teeth missing; where you, for instance, have a case where you have got a lateral on both sides and then the bicuspid missing; or have the cuspids in place and the laterals missing; what method do you adopt in placing them?

Dr. Fossum: I would use stationary bridge work. Let us assume that the first upper bicuspid and the laterals are lost, the central incisors and bicuspid being in place; it is fair to assume there would be some decay or fillings on the mesial surfaces at the second bicuspid, if not I would make cavities and construct gold inlays, and in these cut a small step at the mesio-occlusal angle. I would devitalize the cuspid and sink a heavy oval post in the root canal, trim off the contact points some and cut a step in the lingual surface where the post enters over the lingual surface and the mesial distal surfaces carefully fit either thin platinum or pure gold and solder this backing to the pin and reinforce with 18K solder. The injection is now taken and facings selected and ground to fit. Always use removable porcelains. Cast on the backing of bicuspid facing the lingual cusp, and a small piece to fit into the step in the inlay of the second bicuspid. After this is cast adjust and wax in position on the model. On the backing of the lateral at the mesio-lingual angle adjust a small ledge to engage the mesio-lingual corner of central incisor. This ledge will prevent the lateral from being forced outwards. The small dovetailed step in the second bicuspid inlay will receive the cast lug on the first bicuspid dividing and will prevent the bridge from being tipped or forced labially through mastication contact point of the central incisor. Is this clear? Since we have obtained a casting method that Dr. Taggart of Chicago studied out through his knowledge of jewelery—because jewellers do cast almost all their work; they simply have an artist to design a piece of jewelery for them, and thousands of pieces are cast according to the design of the artist, and they are absolutely accurate, because Dr. Taggart applied it to our work and we all know how beautifully it works; and if you take the proper care and time in making your model like the jewelers make their models you naturally have very beautiful results; knowing the anatomy of the teeth we do not violate the tooth forms; we have our narrow necks and so on to preserve. Suppose when we make bridges we carve them out too large for the small gingival flats or elevations on the gum adjoining our bridge abutments and we don't get these blue margins of the gum. In New York we had Dr. Lane, of Philadelphia, read a paper upon crowns, and he said the collar crown irritated the gums so much and interfered with the circulation of the periodontal membrane and often loosening the root in its socket, and then it often disfigured the patient, due to the inflamed gingival margin. Well, I don't believe that is true. I don't believe a thin platinum-iridium collar properly fitted on a properly prepared root ever influences the

gum. But I think we are apt to make too wide collars and force them a little too deep under the free gingival plaque on the root and then encroach upon the ligaments of the membrane covering the root. I also believe that it is seldom necessary to make a whole collar for the anterior teeth. When the root is ground so that there is considerable of a shoulder on the lingual surface this can be used for a half collar, lingually the upper incisor roots. If you have a carefully fitted half collar made of platinum-iridium, reinforced with gold and attached to your pin by a metal protection over the root end and well reinforced, you have a powerful grasp on the root, and renders splitting of the same impossible. Usually when a root splits it is the labial portion that is fractured outward; therefore, in the construction of caps for the attachment of porcelain crowns on the upper teeth I believe in the half collar, but it must be fitted with great care, and not flare away from the root of any point. (Applause.)

THE REPORT OF THE BOARD OF DIRECTORS.

BY DR. WALLACE SECCOMBE.

Delivered at Meeting of the Ontario Dental Society, June 1, 1911, in the absence of Dr. Bruce.

Mr. President, Ladies and Gentlemen : I am sure I express the thought of every member in the Convention when I say we are very sorry indeed at the absence of Dr. Bruce, the President of the Board, particularly in view of the fact that his absence is occasioned by the illness of Mrs. Bruce, and I am sure when I say we hope Mrs. Bruce will soon be returned to health and strength, I also express the best wish of this Convention. I am sorry because of Dr. Bruce's absence there is no written report to offer from the Board, but the Programme Committee have asked me to give a short report instead of the report that was to have been given by Dr. Bruce. I hope you will feel free to ask me to stop at four o'clock. I would like first of all to make an announcement, because I may be called down rather abruptly, and it is something I want every member in the room to grasp the significance of, and that is the Practitioner's Course which the Board has arranged to take place coincident with the Exhibition, which will be held in Toronto commencing the last few days of August and running on into September. The dates were arranged particularly with a view to being able to secure a number of practitioners from all over Canada. We felt this course would no doubt be taken advantage of by our own men and others practising outside of Ontario, and so at this time the reduced railway rates will make it possible for these men to attend. Let me say the fee for this course is \$20, but for licentiates of Ontario, whose fees are not in arrears, the course is entirely free. Any men outside of Ontario will have to pay a fee which the Board

felt was very small considering the value which would be given. The course is to be a practical course, enough didactic teaching to give a thorough knowledge, so that the men present will perform the operations with the models in casting, and covering the Roach attachment and all the latest devices in dentistry, and I would particularly urge all the men to take these ten days and come to Toronto. I am sure you will find the course very profitable indeed. I think the date is the last Tuesday of August. I may say that a certificate of attendance will be given to those men who come and attend the sessions regularly.

Now, Mr. President, I received a letter from Dr. Bruce, and he mentioned a number of matters; I don't know hardly which to take up in the very few minutes there are left, because as you know the whole work of the Board is simply an endeavor to raise the efficiency of the dental profession and to raise the status of the dental profession, and you all recognize that this society is engaged in the same work, and all the societies throughout Ontario are engaged in the same work, so that dental success is merited, and we may all congratulate ourselves and feel we are all co-workers together in this great work. I believe one of the greatest influences in raising the efficiency and status of the profession is this School of Dentistry. I believe the profession is to be congratulated upon owning and controlling and conducting a successful School of Dentistry, so successful that it is numbered among the best colleges in the world. (Applause.) It is a great advantage to the profession to be able to absolutely itself control the matriculation standard, to control the course of study, to say what subjects have to be taken, and the standard reached by students before they are graduated, because the students of to-day are the dentists of to-morrow, and in this way the profession has control, and this School of Dentistry becomes a large factor it seems to me in the raising of the status of the profession, and it is in relation to the School of Dentistry that a great deal of the work of the Board is done. When I tell you the salaries alone of the School of Dentistry, considering the summer session which is now taking place, are over \$21,000, you can quite appreciate that this has grown to be quite a large institution. I mention these things, gentlemen, for this particular reason, that we have equipment here for 300 students. At the present time we have 200 students. I would like you all to remember that there is no dental college in Canada west of Toronto; I would like you to remember that of all the emigrants coming into Canada the percentage of dentists is very small, and it simply means here in Toronto we have to supply the needs, not only in Ontario, but the need also for dental practitioners out through the west very largely, so that we can well afford to have, particularly in view of a public campaign for dental education, which will mean the requirement of more dental service, and we ought to have 300 students in this institution, and we will do that by having 75 men each

year instead of 50, and we will start that next year, I hope; and what the Board would like the dentists of Ontario to do would be to try to direct superior young men to the dental profession. Gentlemen, there are great problems for the dental profession to solve, and it needs bright minds, and you owe it to your alma mater you owe it to dentistry, to direct these young men to dentistry. When there is a young man in your town, a young man of promise, wavering, and who does not know what to enter, direct him into the dental profession, and I may also say young women, because we are also blessed in the dental profession with lady practitioners. We would like you to be loyal to the College, and let your loyalty be of the active sort, because it is needed just now while there are no dental colleges through the Northwest.

The other matter that I will not have much time to refer to is the matter of litigation that has been on hand by the Board for a number of years. Three or four years ago the Board found itself confronted with a very awkward situation. It would take a long time to enumerate all the quack offices in Toronto; and this was not only true of Toronto, but of other points—painless and real painless, and American cut-rate painless, and all kinds of painless offices—and the Board had to face that situation, and they decided that under their old Act they had the right to discipline any member of the profession; and under that general clause in the Act they passed a by-law with regard to certain offences and a by-law to institute a Discipline Committee and to carry out the machinery necessary for the cancelling of a license. These men, I guess about 15 of them, were summoned before the Discipline Committee. Most of them responded, and quite a few gave their undertaking to cease; but there was one group of individuals who were working for Mr. Henry for the Toronto Painless Dental Parlors,—Mr. Henry financed the litigation,—these men gave their names to it, and when the Discipline Committee first met an information was issued in the name of Dr. Little, and that case went to trial and the court practically said we had the right to do what we had done; but one of the by-laws was technically faulty, so the Board at the next session passed a new by-law. The next time the Discipline Committee made a start, and Mr. Gordon's name was used in the litigation and they held up the Board again. So that this whole matter has been making progress, but slowly it must be admitted. However, gentlemen, the case went to the highest court, and all along the line the dental profession was successful, and it was declared we had the right, even under the old Act, to discipline. At the last session of the Legislature the Statutes Revision Committee gave us a new Act, and instead of leaving the general section, which said we had the right to discipline, they have added a number of sections incorporating all these judgments, in which the courts have said we have the right to cancel. So that, in our new Act, it is specifically stated we have this right, and a

Discipline Committee is provided for in the Act, and they have the right to proceed, with all the machinery, including taking evidence under oath and the summoning of witnesses. The Discipline Committee is going to meet in a very few weeks. There is quite a little material before us at the present time, and the Board proposes to purge the dental profession of any quackery or dishonesty. It is gratifying to know that our friend, Mr. Henry, has now gone to New York to open a dental office. If they receive him there they are welcome to do so. We have no vain regrets in the matter.

There is one feature I would like to speak of, ladies and gentlemen, and that is that there are dentists in Ontario who have been a little careless in the matter of allowing laboratory men to work at the chair. This has been known, but we have not been able to do much with it; in fact we have done very little with anything except nurse along these lawsuits. But now these are off our hands the Board proposes, after fair warning to the profession—because the new by-law and Act will be sent out to every licentiate in Ontario—to see that any dentist who allows a laboratory man to work at the chair, or an assistant of any kind, will surely hear from the Discipline Committee, if the matter is reported to them; and under the law, the ordinary criminal law, the laboratory man may be brought up for practising without a license, and fined. But, quite aside from that, the Board take the position that they will proceed against a dentist for allowing the man to work in his office who is unqualified. There are a number of things in the new by-law and Act which I am sure the profession will be glad to read, and I am quite sure the whole matter will have a very helpful influence in raising the status of the profession in the Province.

In conclusion, I would like to refer to one fact, and that is that because the new Act has thus provided for the Discipline Committee, it was decided at the last meeting of the Board to have all of the prosecutions in the Province centred in this committee, and in that way one prosecutor, one solicitor, will handle all of the prosecutions, and there will not be the local difficulty that dentists sometimes feel in not wishing to lay a complaint against others in their immediate section. We believe, with this machinery, that any complaints which any dentist has to make with regard to the infraction of the law will be well looked after under the new arrangement. I am very sorry Dr. Bruce was not present to offer this report to you.

THE PRESIDENT: Gentlemen, I am very pleased we had a few minutes crowded in in our programme to hear this report from Dr. Seccombe and from the Board. It is very interesting for us to know there is going to be a practitioners' course. It is also interesting to us to know there is a great scarcity of dentists. The profession is to be congratulated upon having a Board of Directors who are bent upon cleaning up the profession in Ontario; and that Board, I think, is to be congratulated upon having a man who has

such a grasp of affairs as Dr. Seecombe and such an interest in professional work. He might think me a little particular in calling him to an exact ten minutes to begin this other part of our programme at 4 o'clock, but we have a little numerical calculation here, if you notice. By our programme you will notice we have six ten-minute papers, with six discussions, to be all taken up in one hour. If you figure that out you will have the discussions very short.

"HOW TO TREAT A PUNCTURED TOOTH."

HAROLD CLARK, D.D.S., TORONTO.

Read before the Ontario Dental Society, May 31, June 1 and 2, 1911, Toronto, Ont.

Mr. President, Ladies and Gentlemen: I have first to say that there is some mistake somewhere in connection with my name being on this programme to write a ten-minute paper. I believe I can trace it back to my friend, Dr. McDonagh. I was asked to write a paper upon it, and I didn't feel that I had enough of specific interest to write even a ten-minute paper, especially after I had talked to one or two one evening a few of you were together, and I found that my method was practically the same as the method that they had used, and as I have no doubt all of you have used. If I have had any success more than some others, I think it must be that perhaps I have used a little more patience. Dr. McDonagh saw some cases before I had treated them, and he thought they were a rather doubtful problem, and they turned out successfully.

Now, I offered to enter into the discussion, if there was a discussion upon the subject, but nobody else was assigned the paper or the subject. I don't think I will take even the allotted ten minutes, but I will try to tell what I usually do in a case where there is a punctured root. We will suppose it is a root that is going to be crowned. Someone, of course it is never yourself, has undertaken to prepare the root or prepare the canal for a post; he has found the canal, so far as he drills; his aim has not been good, and he has gone out the side. Now, in the first place, you very often find an abscessed condition. You have to correct that first. Another trouble you have there, the main trouble, perhaps, is the amount of moisture and blood that will come down. That requires a great deal of careful and patient treatment. The best agent I have found for the correction of that is about a 15 to 25 per cent. of trichloroacetic acid. Before correcting this condition you should ascertain where the natural canal is, and get that well established. As a rule these punctures are a well-defined round opening, and I take a gutta-percha cone that I can pass up through till the patient

can feel it touching. The idea is to have something that you feel sure when you put it in will not come short of the end of the puncture, so that you are sure it will go to the end, and possibly a little further. Then get that as thoroughly dry as possible and aseptic. Then have a thick solution of chlora-percha and fill this as well as you can with it. Dip your cone into this solution and put it part of the way; then leave it for a few moments. All the time you leave it there it is softening. Then in a few minutes push it a little further and further until you have pushed it in quite tight. Now, that cone which, while it was dry and hard, will go through and hurt the patient. The patient would feel the irritation of it through the opening. You will push it right through, and they will feel nothing. It simply means it has softened, and instead of standing out in a point like that, you have perhaps got a little of the solution through there, and then, with a hot instrument, nip it off and proceed with whatever work you require to do. In a few words, that is all there is to the process. In one case I refer to I think Dr. McDonagh will remember I had to remove a bridge where the patient was in great pain. When we took the bridge off we found both the cuspids supporting a large bridge were abscessed and very loose, and on examination I found the left cuspid was punctured in two directions. His first aim was wrong, and his next one was in the other direction, and was worse, and it was abscessed. In one case, I think it was on the left side, the post stood right out through the opening. It was extremely desirable to save those roots and get a bridge on in some way. It seemed impossible. We discussed the matter over the phone, and we agreed that the chances were very slight; but I worked with it in the way I have described here, and the abscesses were cleared up, and I don't know how many years that was; but we made a new bridge, and those two teeth are supporting this gold abutment bridge—those two are taking part in the support of that bridge—and the last time I saw it it was perfectly comfortable. I don't know that there is anything new in what I have told you, but I have told you all that I know about it.

DISCUSSION.

Dr. Spaulding, who was to have opened the discussion, was not present.

Question: I would like to ask Dr. Clark when he considers that ready to fill. I have had a few of them lately to contend with, and I have generally found it hard to get that sinus to heal, and I would like to know if he advises the covering over of that puncture before the sinus heals up? Will that sinus heal up before you fill over the puncture, before you insert the gutta-percha cone?

Dr. Clark: You mean before this one is stopped exuding into the canal labially? Of course I would heal that up first before I would close up the canal. Treat that the same as you would any abscess out through the natural foramen.

Dr. Meek: Doctor, sometimes instead of having that hole put through there with a burr we find it decayed up perhaps a sixteenth of an inch from the gum margin, and the gum has come through and filled that canal up, and the part that has decayed. Can you give us any idea how to remedy a hole of that kind?

Dr. Clark: It is hard to lay down any general rule that will cover all cases of that kind. You have got to take each case as it comes along and use your ingenuity, and of course you will now and then have failures. I have very often met this, perhaps not exactly the same case as you may have in mind, but in molars you will very often find that the decay has gone down between the roots and has opened right through. I have found that by first of all, in my first operation, cutting away all that is weak and bad in the tooth structure and getting that in a healthy condition and packing it well, and then in the next operation laying over this puncture a piece of softened base plate gutta-percha and building on that, I have had a great deal of success often where I didn't expect it. Within the last three weeks I saw a case where one root was absolutely severed from the other two, and it was very desirable to retain this tooth. I treated it in the way I say, with a screw post in this isolated root and another one in one of the other two roots, and then built amalgam over this gutta-percha and around these posts, and put a crown on. That was as much as eight or nine or ten years ago, and as far as I can see it is in just as good condition as it was then, and that was completely severed. I did the same for my brother once, and after he had worn it five or six years he was pretty ill up in Muskoka, and I think he went down and had it extracted; but he had worn that for several years and had good service from it. But, by softening a bit of gutta-percha, after clearing away all the degenerated tissue, and packing that up for a while, and then taking the packing away and then carefully laying on a piece of gutta-percha, has given good service. I think the case you suggest is where there would be a thin place that had gone through. I have had cases like that that baffled me, and I have had others that I have had success in. It is a matter where you have got to have the actual case before you can tell what you ought to do with it.

Dr. Klotz: Instead of using the gutta-percha, use a piece of sheet lead. Then you can put any other filling on top of that, and you will have good healing and no trouble about it, and the more so where the pulp chamber has been opened.

Dr. Clark: That would apply more to Dr. Meek's case than the one I have outlined.

Dr. Klotz: Use a piece of lead cone; file a piece of lead down. The solution of trichloroacetic acid is absolutely the best you can use. You can get your cavity dry and cease all the weeping of blood or moisture that is there, and then, on exact measurement

you can nip off where you like. You have a seal there that will never give any trouble.

Dr. Clark: Haven't you found the gutta-percha well tolerated by the tissue?

Dr. Klotz: Yes, because it is my favorite root canal filling.

EPULIS, FROM THE DENTAL STANDPOINT.

BY FRANK WOODBURY, D.D.S., HALIFAX, N.S.

Read before the Convention of the N.S. Dental Association at New Glasgow, July 14, 1911.

Dr. Channing C. Simmons, of Boston, in the *American Practice of Surgery*, describes "Epulis" as a tumor springing from the gums, usually classed with "Sarcomata," but is benign. The disease has a distinct relation to irritation about the teeth. It is most often seen among young adults between twenty and thirty years of age, but may occur at any time of life. They arise, according to most authorities, from the periosteum. They are of two main types, fibrous and giant cells. The fibrous variety is firm and on section displays a reddish gray colour and sometimes contains spicules of bone. Microscopically it is vascular, cellular, and composed of spindle cells and a few round cells. The giant cell type is softer, of deeper color, and has microscopally the appearance of giant cell sarcoma. Between these types there are a great variety of forms. In *Erichson's Surgery* we find the following: "Epulis is a tumor springing from the periosteum and edge of the alveolus and implicating the walls of the sockets. It is of two kinds, simple and malignant. The simple is a fibrous tumor. The term malignant Epulis is applied to a myeloid sarcoma springing from the alveolar border of the jaw." To quote the *American Practice of Surgery* again, when discussing giant cell sarcoma, the statement is made: "In the alveolar process the giant cell sarcoma forms one variety of the tumor known to surgeons as Epulis."

It would be safe to say that Epulis appears to include any variety of growth of the alveolar process which takes the form of a distinct tumor. In the first stages it is difficult to differentiate from hyperplasia, fibroma, or sarcoma without microscopical examination. In the fibroid form it most commonly occurs in the lower jaw, usually between the teeth, with a tendency to grow buccally. At first there is not much change in the color of the mucous membrane, but it soon assumes a plum or maroon, and as it advances develops a warty appearance. The myeloid variety is spongy and the surface is more irregular. In both instances the growth has a strong tendency to separate the teeth and carry them with it as it grows. The etiology is in many cases obscure, but it would seem that the presence of salivary calculus, pyrrhoea, presence of dead pulps, and in some cases imperfectly treated root canal are among the causes.

My own more or less limited observations, as partly set forth in the case reports that follow, indicate pretty clearly that the teeth are the most prolific cause.

I desire to treat this matter from the standpoint of the dental surgeon. We should know the lesions which occupy the field covered by the teeth and alveolar process as none others know them. As this disease is distinctly a disease of these tissues, none should be better authority than the dentist. Epulis, whether benign or malignant, is a disease to be treated radically. I can find no authority advocating a course of delay after diagnosis. Some have, in the past, advocated conservative operations, endeavoring to save the teeth, but recent writers are practically unanimous in advising thorough removal, and that the teeth must not be considered where any doubt exists respecting the extent of the lesion, and the alveolar process must be removed to and beyond the apices of the roots, including the mucous membrane and the periosteum. In the fibroid variety there is usually no need to destroy the bone beyond the alveolus, and the recovery is rapid, with no tendency to return. In the myeloid type, the operation must extend to healthy tissue, whatever may be sacrificed, which can only be determined when the operation is complete.

We frequently hear it said: "An Epulis is not fatal, and a few months' delay will make no difference." As dental surgeons, we know that it makes all difference in the appearance of the patient whether the lesion only affects the septum between two teeth and necessitates their loss, with the thorough removal of the alveolas, or whether it has spread to and involves several teeth. No one who knows the value of the teeth can advise delay, and the consequent crippling of mastication. It makes a serious difference if from the benign, it takes on the malignant, and a large section of either jaw be lost, and proportionate deformity of the face should occur, all to no purpose, since an operation must be performed in the end. Procrastination, when no doubt respecting the diagnosis exists, is little less than criminal. Symptoms are almost entirely absent, except the enlarged and warty appearance of the tissue, the inconvenience of its presence in the mouth, and obscure neuralgia, which is frequently found from the earliest stages. Sometimes this neuralgia leads one to destroy the pulps of the teeth involved, in the hope that pulp nodules or some other irritation may be causing it. When such general neuralgia occurs in a number of the teeth, it is wise to hesitate, and among other things to mistrust the beginnings of Epulis. If ulceration is present the breath will be fetid. In diagnosing one needs to carefully differentiate between it and acute inflammatory conditions of the mucous membrane, polypi, with smooth surfaces, that usually occur about decayed roots, hypertrophies and exostoses of the process, etc. An important aid to diagnosis is the microscope, in the hands of an efficient pathologist, while it is not to be trusted implicitly, one may fairly decide

from well prepared slides whether it is benign or malignant, but the absence of microscopic evidence only indicates the benign character of the growth and the possibly smaller area to be removed.

In discussing this subject thus far I have endeavored to get the latest facts and make no pretense at originality. I am laid under obligations for a free quotation from Bryant and Buck, Erichson, MacCurdy, and current surgical literature. May I present a few cases which have recently come under my own notice and care?

Case 1.—A young lady, seventeen years of age, presented for examination, at the request of her family physician, to ascertain whether her upper incisors could be saved. Upon raising the lip an enlargement over the left central and lateral incisors was discovered, a full inch laterally, and reaching under the wing of the nose vertically. The centrals, left, lateral and canine, were loose and displaced labially more than one-quarter of an inch. Upon pressure there was both on the labial and palatal aspect of the alveolus a distinct eggshell crepitation. The tumor had been lanced with the idea that it was an ordinary alveolar abscess. The incisors were all dead and much discolored. I found the pulp canals had been treated and filled to overcome severe neuralgia. The left lateral incisor was removed, upon introducing a probe, the region of the nasal bone could be easily reached, and posteriorly to the left, it passed on the buccal side of the bicuspid to the first molar. A scraping was made and sent to a pathologist. The case was operated upon and the alveolar process and maxillary bone were removed, from the right first bicuspid to the left second molar, opening into the floor of the nasal cavity and antrum, and involving a part of the septum of the nose. The operation was performed in as conservative a manner as was consistent with safety. The operation was performed January 17th, the face and nose was somewhat deformed, and the tissue contracted in such a way that the lip was somewhat raised. On March 28, the parts having completely healed, an appliance was introduced to prevent further abnormal absorption and contraction of the lip. The features and shape of the nose were quite perfectly restored. A recent letter says that the patient is in perfect health, with hardly noticeable deformity, and she intends to return to school this autumn.

Case 2.—Boy, age 7. He was brought by his father to have the left central regulated. It was turned to labio-lingual position. There was no sign of the right central, the temporary lateral canine and other temporary teeth back to the six-year molar were present, but badly decayed. An enlargement under the lip similar to Case No. 1, was found: the teeth were carried much out of place labially, almost no pain had been experienced, the child had been attending school regularly, but had been recently suffering from anaemia. Upon removal of the deciduous lateral and canine, the probe discovered a large cavity, consisting of a very loosely organized tissue, extending to the right six-year molar, and the half-developed canine

and bicuspid were loose and detached in the tumor. This case was operated on March 2nd, removing the alveolus and part of the maxillary bone from the region of the left lateral to the sixth year molar on the right side. It did not involve the antrum nor nasal cavity. The wound seems to be perfectly healed. In this case difficulty will be experienced in preventing deformity. The teeth on the left side are erupting and the arch expanding, while the excision on the right side will cause contraction. The difficulty of making appliances to ameliorate that tendency is obvious. The pathological examination in this case was negative.

Case 3.—This is a case of diagnosis. A young lady of about twenty-two years of age desired examination for persistent neuralgia. I found she had been treated repeatedly for this trouble; that the pulps in nearly all the teeth involved had been destroyed and the canals filled in the hope of allaying her painful condition, but without result. Between the bicuspid on the lingual aspect of the alveolus, a small enlargement was found extending to the height of the apices of the teeth and between the teeth arose a fern-like or warty excrescence, the diagnosis of which would be hard to mistake. This was confirmed by a surgeon who is giving much attention to diseases of the mouth. A specimen was removed and sent to a pathologist, but the report was noncommittal. The correctness of our diagnosis was maintained and immediate operation was advised. The family physician at her home advised delay. They became alarmed and went to an American city and consulted eminent surgical authority, which resulted in an operation. The tumor was submitted to a pathologist, and it was found to be a malignant Epulis. The case is reported to be doing well, and doubtless will recover. What could be the result of delay except a larger loss of tissue and great deformity.

Case 4.—This is a patient of about thirty years of age, who has been suffering from pyrrhoea, but which is now under complete control. When first seen, some few months ago, there was some separation between the lower right canine and the first bicuspid. The teeth were thoroughly sealed and the tissue treated with special attention to that point. There was slight enlargement of the mucous membrane, labially. I felt anxious about it from several symptoms which appeared, but thought it might be a hyperplasia, which would disappear under treatment for pyrrhoea. The space is slowly enlarging and the warty appearance has developed: a section was examined under the microscope, which proved little or nothing. I feel sure of our diagnosis. The usual family doctor advice for delay is in force at present, while sincerely hoping to be mistaken, probably delay will mean greater deformity. These are a few typical experiences that may be of value and are gladly passed along.

Before closing, I want to say a few things about the relation of the dental and general surgeon and the family doctor in these

cases. These patients come to us for examination and treatment. Whatever may be the limits of our field of practice, no one questions our right to treat diseases of the teeth and alveolus containing them. As a specialty of medicine and surgery, we have the same rights there that the oculist occupies respecting the eye, or the rhinologist the nose. No physician nor general surgeon pretends to treat the teeth nor the diseases connected with them. The dental surgeon can remove sections of the alveolus, treat diseases of the antrum, open up and remove a sequestrum in the mandible or upper jaw in connection with treatment of the teeth, but in cases such as are presented in this paper the disease may have proceeded beyond our field, and, as in the case of the practitioner in medicine who performs minor surgery, but turns the larger operations to the general surgeon, so we, in these cases, should turn them over to the surgeon, but they are our patients for further treatment, and possible restoration of function and appearance. We should, therefore, have the same consideration, the same privileges of consultation, of being present at the operation, and, if need be, to assist, that is accorded to the general medical practitioner, the oculist, the aurist, or any other specialist who is qualified under the law. We have as much right as anybody to wash up, and don the gown in the operating room of the hospital, or home, as anybody, and we should not be subjected to, nor submit to, any indignity or slight, either in city, town or country. Personally, I have received the greatest courtesy and consideration from members of the surgical profession, but this is a paragraph in dental and medical ethics that will bear to be read in many quarters.

I am aware, gentlemen, that I have brought forth nothing new, but hope something may have been dropped that will be helpful. We are constantly meeting all kinds of diseases in the mouth, and more and more will be required to diagnose and deal with these cases.

Dominion Dental Journal

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VOL. XXIII

TORONTO, SEPTEMBER 15, 1911

No. 9

DOMINION DENTAL COUNCIL AND VIOLATIONS OF THE CODE.

The Dominion Dental Council of Canada has been long enough in existence to have justified its organization. It has conducted its examinations and its business so as to have gained the respect of the Canadian profession and the attention of the dental world. Other countries and professions are adopting a similar organization. It is not clear to those of the profession in the agreeing provinces why Quebec and British Columbia are not willing to cast their lot with the rest of the Dominion.

Up to the present time there has never been any objection to either the professional or moral standing of those holding the Dominion Dental Council certificate. There have been rumors that a holder of a Dominion certificate intended to violate the code of

the Council, but this, so far as we have been able to find out, has not occurred.

In this connection there is an aspect of the regulations of the Council which might be seriously considered. All the provinces of the Dominion have not granted disciplinary powers to the dental councils or boards. In fact, only a few councils have such powers. Once a license is granted it cannot be revoked. Just here comes the difficulty with the holders of Dominion certificates. The candidate agrees that his Dominion certificate may be cancelled if he violates the code of the Dominion Council. But the cancellation of the Dominion certificate does not carry with it the cancellation of the provincial license which he has received because he was the holder of a Dominion certificate. Thus in those provinces in which the boards have not disciplinary powers a holder of a Dominion certificate may violate the code and have nothing worse happen to him than the loss of his Dominion certificate, which he may not now value, having once received a license. It has been suggested that in those provinces where the councils or boards have not disciplinary powers, holders of Dominion certificates should not be granted provincial licenses, but instead permits to practise for a stated time, and which may not be renewed if the code has been violated. Then the Dominion Council could cancel the certificate, which would effectually deal with such violations. The permit to practise should grant full professional rights, such as payment of the annual fee and voting for members of the council. It might be a question if full professional rights could be granted on a permit which was not a real license.

Editorial Notes

Dr. J. L. Anderson, of Waterford, has taken over the practice of Dr. Wisser, of Oakville, Ont.

Notwithstanding the regulations of the Dominion Dental Council of Canada to the contrary, a dental publication has recently published the marks of the candidates at the recent examinations.

About fifty members of the profession took the practitioners course at the Royal College of Dental Surgeons of Ontario during the first two weeks of September. Four provinces were represented.

We have received the following books for review, which will appear later:

The Cause and Prevention of Dental Caries, by J. Sim Wallace, M.D., D.Sc., L.D.S.

Notes on Dental Anatomy, by T. W. Widowson, L.D.S.

Essentials of Operative Dentistry, by W. Clyde Davis, B.S., M.D., D.D.S.

A Manual of Dental Prosthetics, by Geo. Henry Wilson, D.D.S., Cleveland, Ohio.

A Hand-Book for Medical Advertisers, compiled and published by Henry R. Harrower, M.D., Chicago, Ill.

Proceedings of Dental Societies

OFFICERS OF NOVA SCOTIA DENTAL ASSOCIATION,

President—Dr. H. W. Black, Sydney.

Vice-President—Dr. W. C. Oxner, Halifax.

2nd Vice-President—Dr. Colvin H. Craig.

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Auditors—Dr. S. G. Ritchie, Dr. R. E. MacDonald.

DOMINION DENTAL COUNCIL EXAMS.

The following candidates passed on all the subjects on which they wrote.

A. D. Adams, J. C. Allen, D. L. Brown, Thos. Cowling, G. V. Connolly, R. S. Decker, W. J. McL. Dobson, F. L. Downing, R. W. Frank, W. H. Gilroy, W. E. Hughes, W. T. Haynes, Roy Kerr, W. S. Lackner, J. H. Lumsden, W. Leatherdale, W. H. McLaughlin, D. A. McCarten, H. B. McKay, A. D. McPherson, C. R. Minns, C. Purden, M. R. Parker, R. E. Robertson, G. J. Robertson, J. W. Reynolds, H. M. Schweitzer, W. S. Lackner, W. G. Trelford, A. S. Thompson, C. E. Vandervoort, C. E. Wright.

PRACTITIONERS COURSE AT THE ROYAL COLLEGE OF DENTAL SURGEONS.

A 'Practitioners' course was conducted at the Royal College of Dental Surgeons, Toronto, beginning August 29th, and closing September 9th, 1911. The course was designed to cover some of the recent advances of dental practice. Each morning there was a lecture or discussion of such subjects as Dental Anatomy as applied to operative dentistry, crown and bridgework and occlusion of the teeth, principles of crown and bridgework, the recent views of dental caries and its treatment, recent therapeutic agents, asepsis in the dental office, anatomical articulation of artificial teeth, prophylaxis, anaesthetics and extracting, minor surgery, orthodontia, oral hygiene, and business methods in dental practice.

Those in attendance were divided into three sections for the laboratory courses which began at 9.30 each morning and continued until 12.30. The laboratory course consisted of mainly operative dentistry which covered preparation of cavities. Casting amalgams, cements and silicates, Crown and Bridgework which covered the methods of attachment of fixed and removable bridges, and construction of crowns by casting and other methods. Pros-

thetic Dentistry which covered impression taking, plaster models, trial plates, adaptation of dentures, anatomical articulation of artificial teeth, and cast aluminum dentures.

Each day at 12.30 luncheon was served in the College building, when such prominent men as Dr. J. S. W. McCollough, Secretary of the Provincial Board of Health, President Falconer, Prof. Cody, Mayor Geary, Dr. McKay, the director of the School of Technology and Castel Hopkins gave addresses.

At 1.30 the classes again assembled in the laboratories for a continuation of the morning session.

At 4.30 each day there was a chair clinic by a prominent dentist of Toronto. These clinics were given to small sections and covered such operations as extracting under local and general anaesthetics, minor surgery, pyorrhoea, sensation denture, business methods in dentistry and the use of cast gold inlays with porcelain and silicate facings for anterior teeth.

The course was carried through without a hitch or re-arrangement. There were not as many in attendance as was expected. The general consensus of opinion was at the close of the course that everything had been very satisfactory and the course well in advance of similar courses which had been attended by some of those present.

The Board of Directors should be sufficiently encouraged to conduct a course if not every year, at least one every two years.

The following attended the Practitioners course held in the Royal College of Dental Surgeons, August 29th, to September 9th, 1911:

S.D. MacDonald, Halifax, N.S.; D. C. Smith, Stouffville, Ont.; M. R. Thomas, London, Ont.; C. F. Walt, Sterling, Ont.; N. S. Coyne, Ridgetown, Ont.; B. Gollop, Milton, Ont.; C. A. Snell, Essex, Ont.; J. S. Simpson, Trenton, Ont.; B. Lemmon, Port Dover, Ont.; H. M. Wilkinson, Newmarket, Ont.; W. D. Staples, Hanover, Ont.; A. G. Campbell, Wallaceburg, Ont.; W. Hayden, Goderich, Ont.; R. Armstrong, Ottawa, Ont.; S. Bradley, Richmond, W.,

Ont.; G. Leighton, Rexton, N. B.; T. G. Thompson, Toronto; G. Howden, Watford, Ont.; G. S. Bonnycastle, Bowmanville, Ont.; M. B. Mallory, Toronto, Ont.; J. Hutchison, London, Ont.; A. H. Allen, Paisley, Ont.; F. M. Martin, Buckingham, Que.; M. Kalbfleisch, Elmira, Ont.; G. H. Irwin, Collingwood, Ont.; O. B. Moore, Bathurst, N. B.; Charles Sale, Goderich, Ont.; A. Wigle, Kingsville, Ont.; Mildred Hanna, Ottawa, Ont.; C. E. Sparks, Kingston, Ont.; F. Frank, Orangeville, Ont.; D. Watson, Bradford, Ont.; M. P. Corrigan, Strathroy, Ont.; George Hicks, Watford, Ont.; W. A. Black, Toronto, Ont.; Fred Conboy, Toronto, Ont.; G. E. McGuire, Dunnville, Ont.; W. Crow, Chesley, Ont.; E. Hart, Brantford, Ont.; L. G. Campbell, Markdale, Ont.; A. Day, Toronto, Ont.; A. Pratt, Kemptville, Ont.; A. H. McNulty, New Glasgow, N. S.

ANNUAL REPORT OF DENTAL DEPARTMENT MONTREAL GENERAL HOSPITAL.

From January 26 to December 31, 1910.

STATISTICS.

Consultations.....	4,365
No. of new patients ..	1,621
No. of operations.....	2,744
Cash receipts.....	\$1,181.35
Grant from City of Montreal per Board of Control..	800.00

SUMMARY OF OPERATIONS.

Administration of ether.....	102
Administration of Nitrous Oxide.....	29
Extractions.....	2,451
Amalgam fillings.....	341
Cement fillings.....	101
Gold fillings.....	72
Porcelain fillings.....	3
Gold inlays.....	14
Dental bridges.....	19
Full dentures.....	93
Partial dentures	49
Davis Crowns.....	21
Gold crowns.....	22
Richmond crowns..	16
Jaw fractures.....	3
Obturators.....	1

DONATIONS.

H.K. Wampole & Co., per Lyman, Ltd., 1

gr. solution, one gr. tooth paste.

Kess & Owen, New York, two dozen Glyco-Thymoline.

Chas. H. Phillips Chemical Co., 50 doz. Milk of Magnesia.

S. S. White Dental Mfg. Co., two annual subscriptions to Dental Cosmos.

NATIONAL DENTAL ASSOCIATION. MEETING OF EXECUTIVE COUNCIL.

There will be a meeting of the Executive Council of the National Dental Association November 4th, 10 a.m., at the New Willard Hotel, Washington, D.C.

This meeting is called for the purpose of selecting Section Officers and Committees for the coming year, and was authorized by the Association at the Cleveland meeting. Members desiring to offer suggestions or recommendations in this connection, should promptly communicate same to any member of Council, or the undersigned.

H. C. Brown, Rec. Sec'y., 185 East State St., Columbus, Ohio.

CANADIAN NORTHERN RAILWAY CANADIAN PACIFIC RAILWAY.

Winnipeg, Man., July 13, '11.
Bi-Annual Convention Canadian Dental Association, Burlington Beach, Ont., June 1912.

Western Canadian Dental Society Meeting, Winnipeg, Manitoba, 1912.

Dr. W. D. Cowan, Regina, Sask.

Dear Sir:—The question raised in your letter of July 4th to General Passenger Agent Canadian Pacific Railway has been considered, and at the present time we feel that if the dates of the Winnipeg meeting are made within one week of the opening of the Burlington Beach meeting, that the going dates of any arrangement that may be put in effect for the Burlington Beach meeting can be arranged so as to permit stopover at Winnipeg, and unless there are some changes in the arrangements now in effect, we would be able to count the delegates going through to Burlington Beach, and in attendance at Winnipeg, in the number required in connection with the return of delegates from the Winnipeg meeting.

We will be glad to hear from you further when dates are definitely arranged.

Yours truly,

W. P. Hunter,

G.P.A., G.T.P. Ry.

A. Creelman,

G.P.A. Can. Nor. Ry.

C. B. Fasten,

G. P. A. Can. Pac. Ry.

NATIONAL DENTAL ASSOCIATION.

NOTICE TO THE PROFESSION.

In justice to the Association, Dr. Johnson and the profession, it has been deemed advisable to send a statement to all the Dental Journals for publication in their October issues in order that the Dental Profession, in so far as possible, may be correctly informed concerning a widely circulated report that the National Dental Association took official action at the Cleveland meeting, condemning tooth powders, pastes and mouth washes.

Dr. C. N. Johnson, of Chicago, read a paper entitled "Mistakes, Common and Uncommon," from which the following is quoted, this being the only part of his paper which refers in any way to this question:

"And in this connection there is another

mistake which the profession is fostering and to which attention should be called. This is the constant use of mouth washes among our patients irrespective of whether or not they are indicated. I am far from condemning the legitimate use of carefully prepared stimulating and antiseptic solutions in those cases where the abnormal conditions in the mouth indicate such treatment, but mouth washes should be limited to their proper indications, and should be eliminated from use in healthy mouths. Their use in these cases has a tendency to do more harm than good. If the mouth is healthy there is always the danger of disturbing the normal balance by the introduction of agents which tend to interfere with function. The maintenance of function is the surest way to health,

and consequently the healthiest mouth is the one which function is most fully performed. The best stimulant for the gum tissue and the best polisher of enamel is the friction of food in the function of mastication, but unfortunately mastication is not always carried out to its fullest efficiency. Therefore, we use tooth brushes to make up this dereliction, and the moment we begin to depend upon solutions and washes to do the work which should be done mechanically by mastication and the brush that moment the tissues begin to deteriorate. I am not arguing against the use of a wash where the tissues are inflamed and the gums puffed and swollen, nor am I criticising, as some have done, the mouth washes which are on the market to-day, many of which seem to be carefully compounded, but I venture to suggest that if the patient could be prevailed upon to have all irritants removed from the teeth in the way of deposits and the gums properly stimulated by massage and the friction of food and the brush that the restoration to health would be just as certain as by the use of drugs, and it would be more permanent. But just here is the rub. It seems so hard to get the average individual to properly care for the teeth and gums by mechanical means unless some powder, paste or wash is prescribed as an incentive. In this particular these agents have been useful. They have

been the means of inducing many negligent individuals to take care of the mouth, when otherwise it would have gone neglected. Most of them are prepared with a pleasant flavor, and they leave the mouth with a refreshed and wholesome feeling as is so often expressed by the patients.

But the whole tendency of our teaching should be in the direction of preserving the normal balance between function and health rather than glossing over conditions by a false reliance on drugs. It is too much akin to the habit of using powerful and not altogether pleasant perfumes as a substitute for good honest cleanliness of person. The individual who carries with him the odor of the bath has little need of musk and he whose teeth and mouth are kept constantly clean is seldom obliged to resort to the "doping" of drugs."

In addition to this the official stenographer writes that one of the discussers stated "that water was the best thing to use in brushing the teeth."

This paper was read before section two and did not come up before the Association in any other way, and no official action, as some of these reports would seem to convey, was taken by the Association.

Fraternally yours,

A. R. Melendy, President.

H. C. Brown, Rec. Sec'y.

THE DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

J. N. Crouse, Chairman, 2231 Prairie ave.,
Chicago, Oct. 5, 1908.

Dr. Richard Summa, St. Louis, Mo.

Dear Doctor:—Yours enclosing circular with reference to the suit of infringement brought by Dr. Taggart against a member of the profession in Washington, D.C., duly received.

The movement is one entirely independent of the Dental Protective Association. Before the Association could take up and defend such suits it would have to be reorganized and put on another basis. Then, too, it is using its funds very close in other litigation, and there would be but limited means to do with, were it in its prov-

ince to take up matters of this kind.

Yours very truly,

J. N. Crouse.

(This is a verbatim copy. The original is on file at my office.)

Dear Mr. Editor:

I request you to publish the above letter because Dr. J. N. Crouse denied before an audience composed of members and guests of the National Dental Association, that he had informed me that he had neither funds nor a properly organized association to take up the Taggart matter.

Dr. Crouse stated before the Iowa State Dental Association ("Record" for July, 1911, page 279) "I had the whip in my

hand because I had the association and money to back it," etc. "I knew I could wear him (Taggart) out, and he knew it and his lawyers knew it," etc.

The wording of his letter also indicates a vacillating state of mind. In view of the deal Dr. Crouse finally consummated with Dr. Taggart, the suspicion becomes justifiable that he was even at that time, (Oct. 5th, 1908), contemplating a perversion of the function of his protective association.

The apparent difficulty of bringing Dr. Crouse and the patentee to an agreement (described in "Record" and "Review") might be attributed to the historic talents of the President of the Dental Protective Association.

In a recent paper, which might have been more appropriately entitled, "When is a process patent not a process patent," and sung to the tune of "When is a door not a

door," Dr. R. Ottolengiv, M.D.S., D.D.S., L.L.D., brought out the fact that Dr. Crouse himself patented a cast filling within the last few years. This probably intensified his compassion for other process patent claimants.

I also possess a letter from Dr. J. N. Crouse, in which he informs me that the membership books could not possibly be spared for copying the names of the members.

As a member of his Dental Protective Association, I fail to see any reason why I should not know who my fellow members are. Therefore, I request other members of Dr. Crouse's Dental Protective Association who would like to find out what they have joined to communicate with me.

Yours truly,

RICHARD SUMMA.

THINGS THAT SHOULD NOT BE DONE.

By Dr. S. G. Perry, New York.

Having named some of the things that I think should be done to insure success, let me mention some that should not be done.

Don't brag about what you know. If you let your patient know what you know, he will know as much as you know, and he may become as much "stuck-up" with knowledge as you are.

If you have the "big-head," don't tell it. If you have it and can keep it a secret it will be alright, because it makes you feel good. The chances are, however, that the secret will leak out!

Don't "putter!" Hit the nail on the counts. Work is the emblem of the age, and every stroke should tell.

Don't split theological, philosophical, or scientific hairs with your patient. You may get careless and split the root. While exposing the fallacy of your victim's argument you may get excited and expose the pulp. Besides you may expose your own ignorance. Be a mummy and keep "mum" during office hours.

Don't wear a long face. It deepens the gloom! Life is not a funeral, though it ends in one. Cheer up, because the worst may be coming.

Don't tell about how many cases of pyorrhea you have treated and cured. The patients may let the cat out and say that you maltreated them, and they endured, and they are not yet cured!

A celebrated man of letters on the downward side of life, in speaking of his health, once said to me that he had observed that he got better, but never got well.

Don't put on the dam and prop the mouth open and talk about Taft to a man who voted for Bryan!

If you are English and trade gold crowns with your patient, don't let yours show in his mouth, while you hide his in your pocket.

Don't be a goose and call Jones a quack! He may retaliate and say there are two quacks!

Don't get angry at Smith because he kills a pulp when he sees it. Some day you may kill a pulp when you don't see it. Then you will both be murderers, and see ghosts in your old age.

Don't put a Perry separator on a pair of superior centrals and screw until the suture opens. You will put the inventor

a hole, and lead your patient to think
him a barbarian!

Don't work too rapidly. If you put a
filling in quickly, it may come out slowly!

Don't charge too much. You may have to
pull, and then you may get too little.

Don't fail to learn to keep a secret. You
will know a great many before you lie down
to die. You will be asked, "Can I trust
you?" Your answer should be "I trust
you can!"

Don't believe that Old Adam is dead!
You will find him alive in some of your pa-
tients. You will know it when your patient
walks off without paying for a bridge of
great size you put in for him. It will be a
bridge of sighs, when you pay Whites for
the gold it took to make it!

Don't be surprised when your patient tells
you that Mother lost all of her teeth be-
fore she was fifty, that Father had double
teeth in front, and Uncle John had a third
set when he died!

And finally, don't be discouraged—because,
if you are really determined to be a dentist
you will know a lot before you retire from
practice. You will get angry—but you will
get over it. You will be discouraged—but
you will find that hope springs eternal in
the human breast!

You will be a barbarian when you are
young, but the mellowing effect of time and
your gentle ministrations to those who
suffer will make you a saint when you are
old. You may die poor, but if you have
lived up to the constitution and by-laws I
have laid down, your old age will be deck-
ed with friends and flowers, and your life
will have been a success.—The Dental Cos-
tumer

A BRITON'S SENTIMENT.

O ye, by wandering tempest sown
'Neath every alien star,
Forget not whence the breath was blown
That wafted you afar!
For ye are still her ancient seed
On younger soil let fall—
Children of Britain's island-breed,
To whom the mother in her need
Perchance one day may call.

J. S. WILLISON.

WANTED.

Position by dental mechanic with five
years experience. Expert gold and vulcanite
worker. Not afraid of work. Now in Van-
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Original Communications

SOME RECENT VIEWS ON THE PATHOLOGY, PREVENTION, AND TREATMENT OF PYORRHEA.

THOS. B. HARTZELL, D.D.S., MINNEAPOLIS, MINN.

Read before the Dental Society of Western Canada, April, 1911

Mr. President and Members of the Dental Society of Western Canada,—I esteem it an honor to be asked to come and visit with you, for it is a great inspiration to be here. I am sure I shall have gained much more by my contact with you than you perhaps will gain from what I may have to say to you, and I appreciate it from the bottom of my heart, and I am very, very glad to meet with you.

The subject that has been assigned me first is pyorrhea, and I am going to designate what I mean by that before beginning to discuss it. I mean those conditions that make for the loss of teeth other than those causes that we commonly find in operative dentistry, caries, abscess and the like, and I am going to start out with the promise that fully 50% of the teeth that your patients lose are lost from causes other than those that operative dentistry ordinarily aims to combat. This being the case it seems to me eminently in order that we as dentists should strive to save that other 50% of teeth.

If I am at all correct in my estimate, and I am not alone in that view of the case that so many teeth are lost from causes other than caries, you will find that observers who have been studying this matter all over the world will agree that there is a very great proportion of natural teeth lost from causes other than caries. Now operative dentistry has been making wonderful strides; prosthetic dentistry has been making wonderful strides, but the pathology and treatment of these conditions that break down the alveolar process and rob the individual of his natural masticating organs has been comparatively kept in the back ground, and because of our great skill, as evidenced by the paper read just a few moments ago, and as evidenced by the beautiful clinics in inlay work and in

operative dentistry that I have had the opportunity of observing since I came to this meeting, on account of the great skill you have acquired you have perhaps felt that it was not necessary to save these teeth, that you were fully competent to supply their loss by artificial means. Now I wish to appeal to you and offer some reasons for the appeal I am about to make, to interest you in behalf of saving these natural teeth. First, to have saved them to the patient and relieved him of the necessity of operative dentistry or prosthesis is a great feature in itself. Secondly, any individual who is suffering the pathological condition which we designate as rarefying osteitis, in which the alveolar process is being broken down, is opening up to infection a gateway to systemic infection that the medical profession and the dental profession have largely ignored. Take, for instance, an individual who is suffering from pyorrhea alveolaris, as I will call it, because we are more accustomed to speaking of this condition by that name than speaking of it as a rarefying osteitis, or, as Dr. Fletcher would say, alveolitis, or as many of us still say Rigg's disease. We all mean when we use these various terms, conditions that make for the loss of teeth other than caries and that involves the breaking down of the alveolar process and leaving the tissues contiguous to the teeth open to infection.

Now, then, the second great reason why we should interest ourselves as dentists to combat this disease lies in the fact that whenever we have a patient who has experienced one of these inflammatory states in which the bone has been broken down and the tissues opened up to infection that you have exposed blood vessels which, prior to the destruction of the bone, were supported and protected, to infection, and I have seen many a case in which the average depth of the pockets that were created by this inflammatory state would be perhaps a quarter of an inch. Now if you stop to think what the diameter of a molar tooth is and average up the diameters and measure the circumference you would have a lineal measurement of 20 inches by a quarter of an inch. Think of opening up to infection by a multitude of bacteria of different varieties in which the pus forming bacterium always is present, an ulcerated surface a quarter of an inch deep and twenty inches long! I have helped at two post-mortems in which septic endocarditis caused the loss of the patient's life, though no other lesion could be found except pus infections around the necks of the teeth deep under the gum. Recently a patient came into consult me regarding a case of pyorrhea, in which she said that she had rheumatism and she believed that the rheumatic condition had probably caused the pyorrhea. I said to her, "How many years have you been suffering from rheumatism." She said two years, and I said, "How many years have you been suffering from this condition of inflammation around these teeth?" She said eight or ten. Well then, I said, "How can you logically give me the conclusion you have made?" And now the medical profession are generally agreed-

that rheumatism is an infection due to the direct infection of the blood, and that being the case how are these infections planted? In all probability they are planted quite as often through the medium of deep pyorrhea pockets as they are in any other possible way. The tonsil is supposed for many of these infections that cause great distress to the patients and cause constitutional conditions which take away life, but as a matter of fact I believe that it will be demonstrated in the future that these oral conditions, these infections existing around the necks of teeth are more frequently responsible for septic endocarditis, pyemia, and conditions of that sort than has been credited in the past, and the physician will come to recognize this fact if you help him in that direction, and you together will work for the eradication of infections that are planted by an avenue that thus far has escaped the close scrutiny of both the medical and dental professions. That is the second great reason why I wish to interest you in this particular field.

Now, then, whether you care to admit or not that so many teeth are lost by reason of destructive inflammations of the alveolar process, I am going to make the general statement and try to maintain that it is true, and that being true, I am going to appeal to you in another direction. If you will admit this fact and will believe it and begin to examine the cases that come to you from day to day and demonstrate that it is true, your next step naturally will be, if you are true to your professional honor, to endeavor to save these people from these destructive inflammations, and because of the fact that your patients have experienced no particular pain or discomfort you say to me: Why, if I attempted to demonstrate to my patients and tell them that they needed this treatment, they never having experienced any trouble, they would think I was simply looking for business, and was probably a grafter. Now there is no need for that view of the case. It is unworthy of consideration, because it is possible to demonstrate to yourselves and to your patients whether or not destructive inflammation exists, and it is so simple and easy to do and will give us conscious power. To further interest you I say to you that if you master this subject so far as it is now known that it will double the amount of work to be done in the clientele of every dentist in practice, because these conditions which demand your care and treatment are so common that you will find that the amount of work necessary to do on your part to correct difficulties which you have in the past allowed to pass untouched will really double the amount of work that you have to do. Does not that appeal to the commercial aspect of the practice of dentistry?

Now then the first thing to consider then is the matter of making the diagnosis. I have been quietly watching the mouths of some of my confreres here. I have noticed several cases, one especially that I would be glad to use as a demonstration case to-morrow. I haven't mentioned it to the gentleman, but I am going to ask him

a little later if he will consent to be my patient, and I will say this, that a pink, healthy gum rarely if ever covers dissolving bone, and the converse of that proposition is true, that a gum that is swollen, that is blue and that is slightly tumid, invariably overlies dissolving bone. Many authors of note say that these destructive inflammations are not in themselves bacterial, that they depend upon traumatic irritants applied to the tissues in a great majority of cases, and to irritants that are carried in the blood stream and act directly on the endothelium of the capillaries that feed the periodontal membrane and the alveolar process.

Now it doesn't make any difference whether the irritant be of a so-called constitutional nature carried in the blood stream by the plasma and exercising its irritating power on the endothelium of the capillary ends which pass through the alveolar process and feed the periodontal membrane, or whether the irritant be an external one of a mechanical nature, or whether it be the decomposing food stuffs left in about the necks of the teeth, or whether it be an accumulation of tartar or sordes around the necks of the teeth, or whether it be food driven in between the teeth by reason of faulty contact points, or whether it be the contact of artificial dentures around the necks of the teeth that lift up and down with every motion of mastication, it doesn't make any difference what the irritant is so long as the irritation is applied you are going to have congestion, and whenever you block the blood vessels you have nature attempting to obviate it, and she does it by what Dr. Talbot calls lacunar absorption, and which other authorities who have given us the pathology of bone destruction agree is due to a variety of irritants, although Hopewell Smith says that bacteria are directly responsible for the presence of this destructive process. However, we may take this general thought for a basis of argument and let it go at that: anything that will irritate the tissues contiguous to the necks of the teeth will certainly bring on congestion, and congestion is always followed by the dissolution of that thin margin of alveolar process which supports the neck of the teeth.

Now, then, admit that as an accomplished fact and that the alveolar process has commenced to dissolve, and when it dissolves you have instead of a tense, fine, beautiful attachment of the gum tissues to the neck of the teeth with just the normal overlap of free margin of gum, a constantly deepening pocket. Now you don't need to have a great amount of bacterial infection for a sufficient focus of pus bearing bacteria to create a flow of pus from that pocket; if you simply have the pocket and a few bacteria at work in that locality, whether you are able to express pus from it by pressing the gums is not a necessity. If you have the bacteria there, there will be constant destruction of bone, and the destruction of bone goes on to the end, but it isn't necessary that you have a bacterial infection to originate that process, and I am going to

tell you why I think that is true, because I have taken pus from bacterial pockets in a large number of cases and performed the experiment of placing that pus in healthy gum tissue with the intention of bringing about pyorrheal infection and watching the subsequent destruction of bone, and it hasn't occurred. There has to be a more or less chronic state of inflammation in the gum before you can plant it, and if you keep the gum tissue hard and healthy, as nature intended it to be, you prevent these infections.

Now there is the first tangible thing I have give you. You can prevent this disease, and I think that the way you should prevent it is very easy, and I will speak of that later.

Now suppose you have inflammation from any one of these causes, it may have been a constitutional cause; it may have been the administration of mercury and the consequent swelling that ensues in those tissues contiguous to the teeth as a result of the absorption of mercury; it may have been phosphorus; it may have been the retention of uric acid in the blood stream, which the kidneys should have eliminated and did not; it may have been one of a dozen different causes that has initiated a congestion in these tissues contiguous to the teeth. However that may be, makes little odds; that congestion, once initiated, the destruction goes on, and as soon as bone has been lost then you always have a bacterial infection planted on the root surface which becomes then a perpetuating factor, not an originating factor, but a perpetuating factor that will continue the destruction of the bone until the tooth is lost.

Now let me discuss for a moment the reason why all of the ordinary local treatments of pyorrheal pockets has failed in the past. The root surface itself is very porous, and if you put into a pyorrhea pocket a product capable of destroying the bulk of bacteria in that pocket you may bring about a condition of comparative health for a short time, but on account of the porous nature of the root surface it soon becomes reinfected, and while the leukocytes are protecting the soft tissues to a very great extent they are not capable of going out of the tissue into the pyorrhea pocket and attacking the pus germs and other bacteria that are working in that porous root surface with sufficient force to entirely destroy them, consequently the root surface remains as a focus of infection and that is the reason why vaccine treatment for pyorrhea or for these inflammations fails. You would not expect to gain a good result or a satisfactory result for the infection of a large lacerated surface by injecting vaccine, no matter whether it was vaccine created for the specific case or not. You wouldn't expect to get a good result and leave on that surface a dirty dressing. That is exactly what happens where you depend on vaccines to correct these pyorrheal infections, you fight the bacteria in the circulation, but you have a dirty dressing on the root surface which constantly reinfects the pocket.

I have in my own experience so often proven that you can eradicate these infections by removing the porous root surface that the very first thing I think of in every case that comes to me is the sterilization as near as possible of the root surface, and the root surface has received comparatively little attention. The root surface is porous and pitted because the fibres that unite the tooth's root to the alveolar process have been sloughed off, and when these fibres slough off there is more or less of the protoplasm left on the root surface and shallow pits left there that harbor bacteria, and of course you cannot get rid of bacteria if they get into that porous surface, and you have the saliva of the mouth to nourish the bacteria as well as blood from the vessels that have been robbed of their supporting and protecting bony walls inclined and projecting towards the root surface, and any movement of the gum or any stress applied to the tissues makes these vessels bleed, and they pour out substances in the blood which are precipitated on the root surface and you have serunal calculus, which in turn acts against the exposed vessels in the pocket, and you have an added irritant to the bacterial infection, viz., the rough coat of serunal calculus on the root projecting towards the gum which causes the vessels to pour out copious food of the proper nature for bacteria which continue to grow on the root surface, and so the logical thing seems to be to clear the root surface of its bacterial holding power.

Now when you grind off a root and prepare it for the microscope take the tissue from behind the root surface so that you have thinned it down thin enough to look through it and put it under the microscope. You have a pitted surface first. Suppose you plane that off and examine it under the microscope. You find a substance with comparatively few openings in it and that surface is as difficult to hold infection as a glass root would be, and when you do that successfully with any sort of instrument, no matter whether you do it with pumice or a carefully constructed plane or a cleaver made for lifting enamel, so long as you just take off the pitted surface you have rendered that root incapable of holding further infection, and my experience in several hundreds of individuals in which I have kept a case record carefully is that the pus flow ceases, the inflammation goes quickly out of the tissues and the tissues resume an ordinary, healthy appearance. The patient asks you: Is that a permanent cure? Will I be free from this infection from now on? Not necessarily. Whatever brought about that infection originally may cause it to recur. Teeth that have been weakened of their bony support are not nearly so apt to resist further stress in that direction as they were originally. It is not fair or right to say you can take a case of pyorrhea and guarantee that it is going to be forever free from that trouble any more than it would be fair for you to expect your physician who has carried you safely through an attack of typhoid or smallpox—I won't say smallpox, because that procures for itself an immunity,

but there are a number of infectious conditions that will recur if you reabsorb the infecting agents that brought them about. If I came up to your city and ran across a good, strong infection of typhoid and ingested it, I would expect to go home and have typhoid again, and I wouldn't blame the man who brought me through the first attack for the second attack, because it would not be fair, and if an individual allows conditions to obtain in his mouth which will bring back the congestion a second time he will have destruction of the bone the second time, and he will suffer the ravages of pyorrhea again, but if there is bone enough left in the alveolar process to give these teeth ordinary support, sufficient support, so that you overcome the first congestion and you have stamped out the infection, and the gums become pink and hard again, and the patient will keep the necks of the teeth scrupulously clean, and he evens up the application of force in mastication so that there will not be a congestion on account of uneven application of force, he will not have reinfection or a recurrence of the destructive inflammation, and if you keep these patients under surveillance after you have given them treatment you can reasonably expect to carry them on to the end of their lives without the loss of more bone, provided you make the physical conditions in the mouth what they should be to resist external infection.

Now, then, the histologists in the past have dismissed the general subject of the root surface by saying that it was simply a coating of sementum, and they have ignored the possibility of removing a portion of the root and leaving the glassy surface as a result. Now if you do not believe that is really the case, it is very easy for you to prove it yourself, by making a few root preparations and studying them under the microscope. It is also easy to prove it for yourself by carefully planing a root surface of its porous coat and watching what happens after that surgical treatment of the root surface has been given to it. You will find that the inflammation vanishes, that the tissue resumes a normal hue, and that the evidences of infection are gone. You may find, by very close examination, that there will be some infectious bacteria still left there, but you will find you have made it possible for the leukocytes in the circulation to take care of the bulk of them if you remove that porous root surface.

Now those are the essential things necessary to eradicate inflammation and bring the tissues of the tooth back into a fairly normal condition, in which to fight future infection, and the question arises: is this possible for you all to do, and how shall I judge whether I will attempt to do it or not? I say this to every one of our students: Take your patients and make a critical examination of the mouth with a chart before you. Take your exploring instrument, whether it is a root canal plugger or whatever it may be, and feel around the neck of every tooth, and demonstrate for yourselves whether or not pockets exist. If pockets exist it is

proof positive that that tooth needs surgical treatment. Plane the root surface in the pocket, and leave the surface underneath the gum clear and smooth. The patient may say: "Is this an expensive operation?" I say to the patient: "I feel that it is worth just as much as any operation in dentistry," and charge him accordingly. It doesn't follow that you have to charge the patient \$40 an hour or any extraordinary fee, but just convince him that if he has lost some bone that he has opened up an area of infection: that he is always capable of taking infection and maintaining it until his teeth are lost, and that if you can, by a few minutes of skilful operative surgery, make that root surface so that it will not longer hold infection, and instruct him how to care for his gums so that they will resist congestion and remain pink and tense, that he can keep them so to the end of his life if he unites with you in giving them the care he should, that patient will respect you just as much and feel just as kindly toward you and spread your professional fame further than though you made him a beautiful gold inlay. Now that is just the point I would like to have sink into your minds, because if you do this you will save many more teeth than you are now doing. Perhaps I am bringing coals to Newcastle; perhaps I am bringing you things you already know, but if you already know them, kindly pass them on to the other fellow who is not doing it, and let this idea in our profession, which is steadily gaining ground, of preventing trouble rather than getting people out of trouble rather than getting people out of trouble after they are in, become the keynote of our professional work. Prophylaxis instead of cure. Prevent the trouble if you can.

Now I do not wish to tire you. I might talk for another hour on this, and say things that might be valuable, or might not, but I have been asked by President Garvin to touch on two or three other things, and I am going to simply content myself with showing you the ordinary process we use in our college, and do a clinic to-morrow, and let it drop right there. My whole hope and object in life as a teacher has been to help. I realize that there is an infinite amount that I do not know, but if the spirit of helpfulness will cover, like a mantle of charity, a multitude of sins, certainly I am going to get a few of my sins covered, because I want to help.

Now here is a case of instruments that might at first sight become confusing. But allow me to say, as far as selection is concerned, there are just eight instruments, and they are in three types, and I will just briefly describe them. You will notice that the case is divided into three belts of colors—black, white and red—and that the instruments are in three sizes. Each group of eight is simply four pairs of instruments, and when you learn the application of any one group of eight you have learned the whole group of instruments, and it is not confusing at all to learn how to operate with a group of instruments of this kind, because, when

you have learned how to select any one of a given eight, you have learned how to select any one of the whole set. There are three types of blade, one made to cut upon a convex surface, one for a flat surface, and one made to fit a concave surface, and they are arranged so that there are 24 of each. In one end of the case the instruments are comparatively straight, in the other crooked. These are the principles necessary to make an instrument to do this work, and they are not patented, and they cannot be patented. There have been repeated efforts made to patent this particular instrument, and they have failed time and time again, and I hope they always will, because it is a boon to dentistry, and anyone who so desires should be able to make and use them.

The principles necessary for an instrument to do this work involve, briefly, three or four things. First, that the blade should be in line with the shaft. No matter how crooked you make it, bring the blade back in line with the centre of the handle, so that when you put the blade into a pocket, you are, in effect, working with a straight instrument which will not tend to slip away from you as will an instrument whose cutting edge is off to one side.

Now, the second point is that this porous root surface is very thin, and rests on a floor of hard bone, which separates it from the more cellular bone of the cementum. If you cut through that hard layer and open it, pus germs are going to get into the bone cells, and you are going to have infection which you can never eradicate or get rid of; so you want an instrument limited in its cutting depth, and that is done by just sharpening it almost at a right angle, or not more than six or seven degrees more than a right angle, and in that way the cutting depth will always be very, very limited, and will not permit you to cut into the lacuna, and will enable you to leave the root surface so that it will not reinfect.

The third important point is to keep your instruments sharp, and to do this you want to be careful always to test your blade before you begin to work. If it is dull, if it doesn't take hold properly, it either doesn't fit the surface you wish to work upon, or it is dull. In either case it is worthless to you; you must fit the surface you are working upon, and you must have a sharp blade.

There is one other thing I might say about this group of instruments. You want to have a few blades that are shaped or constructed so that the blade can follow into the hollows and plane them out. Now, do not think that when you have gone over a root surface with any one type of blade, and it feels good and true to you, that you have accomplished what you set out to do. You never can be sure of a root surface that you have planed until you feel for depressions in it with a blade that is capable of getting into the bottom of the depression, because if you plane a root surface and get off nineteen-twentieths of its infected, stinking coat, and leave the other one-tewentieh, you will still continue to have a pus flow, but if you get it *all* off, you will not.

"HOW TO BLEACH A TOOTH."

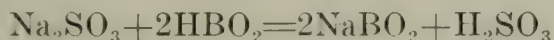
G. J. ROBERTS, D.D.S., BRAMPTON, ONT.

Delivered before the Ontario Dental Society, Toronto, May 31, June 1 and 2, 1911.

Mr. President, Ladies and Gentlemen,—Instead of presenting a paper I shall do as the gentleman who wrote me requested—give a short summary in detail of the method I pursue in reference to treating a case of this kind. I may state in the first case that the two causes requiring this course of treatment are those of either accident or neglect. Many of you know and possibly have experience along this line, that lacrosse is one of the most fruitful sources of accident resulting in discoloration of the teeth. The pulp is destroyed and the tissue infused. The other is neglect, as far as dental operations and care of the teeth is concerned. Now, my method of treatment in the first place is to make an extensive opening into the cavity, remove all decay and deposits, and after this has been done I take a burr and enlarge the root canal, remove all disintegrating material, cut out all around the bulbous portion of the pulp chamber thoroughly, or in other words remove all discoloration in the dentin that is practical, being particular to cut down to the incisal margin or cutting edge of the tooth. I must state here that bleaching, in the ordinary acceptance of the term, is only permissible in the six anterior teeth, or at the outside including the first or possibly the second bicuspid in rare instances. The same course of procedure must be followed in every case. I think the success of the operation to a great extent will depend upon the extent to which this discolored and decomposed dentin has been removed. After this has been done, wash the cavity thoroughly and freely with water. Don't be afraid to use plenty of water. Then after that a boracic or ammonia and water solution may be employed. Some claim this removes the fatty material in the cavity. Then apply the rubber dam. We will suppose, for this case, that the root is in a healthy condition. If not, use the ordinary course of procedure. The next step is to fill thoroughly the apex of the tooth. I do not use, as has been advocated years ago, to fill the root of this or any other tooth, gold. There are many other materials in my opinion preferable. At any rate, seal the foramen thoroughly in that particular tooth. Now we are ready for the bleach. The first thing is to dry the tooth thoroughly. Then our next is our choice of the bleaching agent. I will state, for the information of those present, certain substances that have been used by different operators. The first I had any experience with was bleaching powder, the ordinary calcium chloride. An objection to this was that the samples obtainable were usually unsatisfactory on account of the lack of chlorine. Now, suppose we decide to use the ordinary bleaching powder. The difficulty in introducing this agent into a cavity is great to some operators;

but possibly this method might be employed by almost anyone. Dip the instrument to be used—and I may state here that it is not advisable to use an iron instrument in this case; some prefer a gold-tipped instrument, some a bone instrument or any of those instruments that acid will not affect—into a weak solution of the acid, say oxalic (ten grains to the ounce has been used by some with satisfactory results; dip it into the acid and then into the powder, and carry the powder to the cavity. Thoroughly filling it. After this operation, if your cavity be thoroughly filled, immediately seal. Some prefer gutta percha; some object to that; some use oxyphosphate—whatever you like, only seal the cavity. Then the patient is dismissed, and possibly in the course of a week or ten days' time the temporary filling is removed, the cavity thoroughly washed and a further application applied. Another method is by moistening the same powder with water, packing the cavity full, dipping a piece of cotton in the acid solution, then moistening the powder in the cavity and immediately sealing. The same object will be attained.

Another agent employed by some and said to be useful in difficult cases, is sodium sulphite and boracic acid in the proportion of 100 parts of the former to 70 parts of the latter. This with a drop of water added in the cavity produces the following chemical reaction:



Here sulphurous acid acts as a reducing agent. It unites with oxygen and forms sulphuric acid.

My own practice has been for some years to discard all these preparations entirely, possibly on account of the unsatisfactory results I have had with some of them. After thoroughly enlarging the cavity I remove all the debris and everything of an objectionable nature. I dry the cavity thoroughly, take a good solution of peroxide of hydrogen, saturate the cavity thoroughly, root and all, and then allow that to remain for a moment or two and dry thoroughly again. You will notice in this case the bleaching agent is oxygen. I have had success with peroxide of hydrogen where the other agents I have employed have failed. These are the methods, I think the best-known methods to the profession at the present time. That is the easy part of the operation. On the 24th May a gentleman said he was coming down to hear this discussion. He said: "I don't care about how to bleach a tooth. I know that. But how do you keep it the right color?" That is the rub. You have your tooth; you can bleach it till it looks like chalk or milk. The next thing is to put a white intermediate filling under your enamel or under your thin coating of dentin. The method I employ is this: to moisten the cavity with a solution of chloride of zinc, have a thin paste of oxychloride, work that in position, work it around exactly the same as you would fill the canal cavity. Then after that has

been done, take a piece of cotton, saturate it in the solution you have on your slab and press that around very much in the same way you would for infiltration anesthesia. This being done I put in a temporary stopping and dismiss the patient. I have been more successful with this treatment than with anything else I have been able to find.

I have laid the matter before you more for the purpose of introducing this subject for discussion. There may be ladies or gentlemen here who have given this more care than I have. I can state frankly I have not always been successful, and not often successful with the treatment of bleaching a tooth and having it the same color in five years' time, or in a color that satisfied me; and I have done what possibly many of you will be forced to do before you are as old as some people, and that is remove the crown of the tooth and insert an artificial crown.

DISCUSSION.

Dr. Amy: Mr. President, Ladies and Gentlemen,—I really don't find very much in that paper to discuss, that is, if discussion means finding fault with it, because, as far as he went, I agree with him. As to the first of the bleaching agents which he used, I have not used that; but I have used pyrozone, 25 per cent.; but be very careful that you get the proper strength—that it has not been left too long. I also used sodium dioxide. I use that at the chair in the first place. When the patient comes to me and I have treated that tooth so that the tooth is perfectly aseptic, I fill the root with gutta-percha, then put the rubber dam on and use sodium dioxide, and wash it out. I do that two or three times at that sitting, then seal in the pyrozone and send him home. After a couple of days the patient comes back, and I will wash that out with an alkaline solution, 10 per cent.; then I put in another one and send him home for two or three days. It is according to how light I have got that as to how many times I treat it after. I have got it to what I think is a sufficiently good shade, which will probably be a couple of shades lighter than the other teeth. I use the oxychloride of zinc, and put in porcelain or Aschers artificial enamel if you prefer it. As far as its remaining bleached, I have never seen any yet that would stay exactly the color that you left it. I might tell my own experience in two or three cases, possibly, within the last six months. In one case I had devitalized the tooth, within the last six months. In one case I had devitalized the pulp, She felt rather bad about it, and so did I; but I got to work, and I didn't drill out all the discoloration because it had been drilled out pretty well before, but I bleached it with pyrozone and sealed it up, as I have before intimated, and in that case, up to the present time, I can't see any difference. I saw her the other night. She was in to pay part of the rest of what she owed me. She thought it

was about safe to pay me then. It had stayed that long, and she thought possibly it might stay later on.

Then I had another case which was not of that length of time duration. She came to me with a very badly discolored tooth. I believe it was of some years' standing. I used sodium dioxide in that case first, and then used the pyrozone. I saw her some little time ago now, and I can't say that was as successful as the other one, although it had not got back to anything like what it was before; still you could tell it wasn't the same shade as the one next to it. I thank you, gentlemen. (Applause.)

The President: I very much dislike to cut off the discussion on this subject, but I think it has been the fault of the Programme Committee in giving us ten-minute papers without any time for discussion.

HIGH PRESSURE ANAESTHESIA.

THOMAS B. HARTZELL, D.D.S., MINNEAPOLIS, MINN.

Read before the Dental Society of Western Canada, April, 1911.

I have very little to say about high pressure anesthesia, and the only reason why I am asked to speak on it at all was that our friend, your worthy President, happened in my office one day when I had just finished some high pressure anesthesia work, and he said, "I would like to have you say something about that."

Now we are all accustomed to practising pressure anesthesia. I presume, and most of us have been doing it by making exposures of the pulp and taking a little unvulcanized rubber and causing that to act as a piston against some form of anesthetic which you use on the pulp, and drive it in by pressure. Of course, that does very well, but there is a better way. At the present time I have the greatest satisfaction with using a syringe which was made by Dr. Myers, of Cleveland, and I have used it for several years, and in my college clinic last fall my best record with this syringe was seven pulps in an hour and ten minutes, and they were comfortably removed. You cannot always do that. I have spent an hour and ten minutes on a single one, but as a rule you can do an anesthesia which is satisfactory to you and comfortable to the patient in a comparatively few minutes: twenty minutes to half an hour ought to be ample time for one to do an anesthesia, providing the pulp is not in a previously inflamed condition.

Now, the principle here, as the word indicates, is, briefly, high pressure. I have in the bottom of this case a few burrs which I brought with me that fit these points. There are many of these high-pressure syringes. I like this because it is so powerful. The needles are long, and the points are made blunt, and they fit a No. O. S. S. White burr, and you can begin the operation by taking

an O burr and making a pit any place on the tooth that is desirable from whence to apply the anesthetic, large enough so that it rounds out and cups out the enamel so that it will not chip, and then take a small OO burr and begin to penetrate toward the pulp. Penetrate as far as you can, and when the patient begins to complain of a slight pain, desist. Fill your syringe and make a second application, and do it by just twisting the syringe a little bit until you are sure you get a good joint, and then begin to apply the fluid, and keep the pressure up for from half a minute to a minute; then penetrate a little deeper with the burr. But if you attempt to do this operation with this particular type of instrument, or any high-pressure syringe, try to stop with the burr 1-32 or 1-16 of an inch before you penetrate the pulp, and finish your anesthesia by heavy pressure through the remaining pulp wall, because if you do not do that, and send the burr directly into the pulp, you are liable to hurt the patient somewhat, and it is very easy to complete the anesthesia by continuing the pressure after you have thinned down the pulp wall to 1-16 or 1-32 of an inch, which will enable you to do an absolutely painless pulp removal.

Now, is this useful? It is extremely useful to me; it may not be to you. Do I kill pulps with it where I attempt to prepare cavities that are sensitive, and expect to leave the pulps in position? I do not. Those are the questions that are most frequently asked, and I am answering them very briefly. If you overfill the pulp you will probably set up congestion, but not if you are careful, and after you have used this method a short while you will soon learn where to stop. Practice makes perfect, and I think many of you, if you were to adopt this instrument or some instrument of like nature, would save your patients and yourselves a great deal of what is now painful and depressing work. Just the day before I came up here I removed two pulps from laterals in forty minutes, and for an exceedingly nervous, critical, fault-finding patient, and when that patient went out she said, "Doctor, you are perfectly wonderful!" I said, "No, I am not. There is nothing particularly wonderful about that," for I have that experience very, very frequently in my work, and you may have it, providing you care to adopt the method. I do not wish to consume more of your time, except to exhibit the instrument, because I am asked to do an anesthesia to-morrow, and if I answer these questions which are commonly asked it will make the clinic a little more clear to you.

Now if you wish to crown a vital tooth with the so-called Carmichael crown, which is frequently difficult to prepare, and which any of us still use in spite of criticism made upon it, and the tooth is very sensitive, this little instrument will help you right through it, and the patient will leave you in a satisfactory frame of mind, and you will accomplish what you set out to do, and painlessly, and you will not have a crop of dead pulps as a result

of its use either. The secret is in not throwing in too much of the anesthetic. Just use enough to anesthetize, and no more. You can bring about an anesthesia that will last for hours and penetrate the whole face. I had it done in the case of a molar in my own mouth, and I had anesthesia from the point of the chin clear up to the lobe of the ear, it seemed to me, and it lasted several hours and was followed by an inflammation which was no doubt due to the injury done the tissues by driving too much fluid into the nerve tissues below the tooth's root.

Q.: What solution do you use?

Dr. Hartzell: Two and a half per cent. cocaine solution, and Dr. Myers kindly sent me some the other day, and I brought a bottle of it up here in tablets, and these tablets are arranged so that you simply take your water syringe, put your tablet in a separate dish and drop fifteen drops of water on it, and you have a solution which is about the right strength. Very frequently I take powdered cocaine on the end of a spatule and just wet it with enough water to dissolve it by the rule of thumb, and draw that into the syringe and use it. I have never had any trouble from it used that way, because you are going to stop short of anesthesia beyond the root end always. If you do not, you may expect to have inflammation following your work.

"INCIPIENT ABSCESS."

HAROLD CLARKSON, D.D.S., TORONTO.

Read before the Ontario Dental Society, Toronto, May 31, June 1 and 2, 1911.

Mr. President, Ladies and Gentlemen,— I don't suppose I shall be able to say anything on this time-worn subject. However, it is possible that something I may say may help to refresh our memories a little and perhaps revise some of our opinions in regard to what takes place when an abscess forms.

I shall assume that a correct diagnosis has been made and that we have infection of the pericemental tissues followed by the usual inflammatory processes, but that as yet we have no pus in any quantity formed; the exudates are still vital. We have been accustomed to regard inflammation as a harmful process, which in itself should be avoided. As a matter of fact investigations show that the usual symptom of inflammation (heat, pain, redness and swelling) are all parts of a beneficent reparative process.

Let us examine for a moment the conditions that obtain when living tissue is inflamed so that redness or hyperemia is present. But first let me recall that this hyperemia may result from two causes: first an increased flow of blood to the part, and secondly an obstruction of any kind which prevents the return of blood from the periphery. Note, too, that it may end either in resolution or

necrosis. Investigation seems to establish beyond a doubt that during hyperemia there is a marked increase of diapedesis or passage of the white blood corpuscles through the vessel walls. There is also a marked transudation of serum, which explains in a large measure the swelling. At the same time, the activity of the fixed tissue cells is greatly increased, resulting in the formation of antibodies, opsonins and phagocytes, which, with the leucocytes, are nature's weapons for overcoming infection. During hyperemia, too, the power of the tissues to absorb watery exudates or even dissolve semi-solid substances is greatly increased.

If that is the case it would be the rational procedure to produce hyperemia in the infected area and thus assist nature to overcome this infection. First of all, though, let us try to evacuate the pulp chamber and sterilize the tooth itself. The patient may assist by sucking, or in certain cases an old hypodermic may be brought into use, and by reverse action, the fluid contents of the tooth may be withdrawn. The application of whatever antiseptics seem indicated, such as formalin in weak solution, cresol, alcohol, etc., will, in due time, sterilize the root canals. Avoid pressure and seal carefully, so that the mastication may not force the pulpal debris through the apex. Then proceed to induce hyperemia.

There are many methods by which this may be done. Those which would be most easily performed might be described as mechanical, and the chief of these is the application of an elastic bandage about the neck. An elastic such as is used for making garters or armlets may be applied so as to press upon the jugular vein and thus impede the backward flow of blood.

The result is we produce a hyperemia of the whole area, and this results in producing these conditions which are manifest under hyperemia, with the result that we have a lessening of the infection and an increased absorption of the inflammatory exudates. It may be produced locally by the use of suction cups, and one which is ready to hand in every dental office is the little rubber cup which we use for polishing. This may be put on a mandril, and you may produce a certain amount of hyperemia by pressing that down upon the mucous membrane and producing suction in that way.

Then there is heat. The most advantageous method is the application of a poultice. Some of them have come down to us from the days of blood-letting. We still hear of the poultice spoken of as drawing the pus out, and so on. That is really not what happens when you apply a poultice: you really produce hyperemia. Even with such a preparation as antiphlogistine, which is supposed to be opposed to inflammation, you really produce hyperemia, and it is the heat in all these poultices that really does the work.

Then hot air may be used (it is useful for a variety of purposes). There may be some men in the audience who have made use of electric lamps, such as the Finsen Ray, for treating these conditions. I have had no personal experience with these. Massage,

osteopathy and kindred movements are all of value, and it is worth knowing, too, that osteopathy is not a new science by any means, but dates back to the time of the Babylonians, and before. These all have their day and seem to go in cycles. It is possible to produce hyperemia by simply rubbing over the gum with the finger. Then a vibrator may be helpful in some way, either applied at the back of the neck or immediately over the infected area, all for the purpose of producing hyperemia.

Then as to the drugs which we shall use to produce hyperemia. They are generally spoken of as irritants or counter-irritants, the idea being that by applying an irritant at some part remote from the site of the infection we may be able to withdraw the blood away from the infection. This is quite irrational. In reality what you wish to do is produce a hyperemia in the infected area. For this purpose we may use ordinary red pepper or iodine and aconite. Perhaps the best of all is iodine. It has the additional advantage that its action is prolonged. It is also a good antiseptic, and has some penetrating power, and in that way we may reach the abscess itself. The use of aconite with iodine is of doubtful value. Fleming's tincture of aconite is of such a powerful nature that it is a dangerous compound to use that (method). I have had one experience, and I don't want to repeat it. It takes very little of it to produce a severe heart depression. The probability is that most of these counter-irritants owe their chief value to the fact that they have a subjective action: that they divert the attention of the patient from the pain in the site of infection and make him think of the pain that they cause, although they also cause hyperemia, because dilatation of the arteries causes hyperemia.

Then, as to systemic treatment, I think perhaps we are negligent in this particular in not directing enough attention to the relief of pain in order to give the patient rest, in order that he may get a good night's rest and allow nature to do her part. For this purpose we must resort to anodynes of various kinds, and chief of these are the drugs that are derived from opium, laudanum, or tincture of opium, or what is known as (combined) tincture—(combined) camphorated compound tincture, or paregoric. The advantage of this drug is that it is easily given to children, and the dose is readily reduced. In the case of children the dose should be reduced much more than the age table would indicate. So that a very few drops of laudanum would be sufficient; one or two perhaps would be sufficient for a child, where an adult perhaps would take 15 to 30.

The use of morphine has been mentioned in the treatment of neuralgia. It would be desirable to use that in extreme cases, and particularly with adults. Then, accompanying the infection, we have fever, and it is our duty to treat the fever in order to give the patient relief in that way, and for this purpose we must use antipyretics. Of these aspirin has the advantage of not being

depressing like some of the other antipyretics, and it also relieves pain. It is particularly useful in those conditions arising from pyorrhea.

I think I should also say that the treatment of alveolar abscess has not received the attention it should, for the reason that most dentists I have been familiar with have been loath to charge a fee commensurate with the service rendered. I can conceive of no operation a dentist can perform for which the patient should be more grateful than the relief of an alveolar abscess. If it is possible to avoid an abscess, and if we can give him a good night's rest and save him passing three or four days of excruciating agony, we are entitled to his thanks, and that thanks ought to be expressed in a tangible way. When we think of what the physician would charge for similar work, our own is insignificant. I thank you.

DISCUSSION.

Dr. G. E. Hill, Toronto: We have now transgressed the hour for discussion by some 45 minutes, and I think we could not do better than adjourn this discussion, and it will appear in the JOURNAL when printed. There are one or two points I would like to throw out as a matter of research. The members of the Ontario Dental Society are now a body of research workers, and there is one little point in connection with this I would like to introduce to you. Every time an incipient abscess rings our office bell, our office becomes an emergency ward. Relief must be prompt, because a systemic anarchist has gotten into an infected area to cause abscess. There must be millions of bacteria to cause an abscess, because it cannot be caused by a few. The blood serum is a powerful germicide and will take care of many thousand bacteria and destroy them, and if the least help is given to the serum many more thousands will be destroyed in incipient cases. Protoplasmic cells have wonderful resistance, and this is the salvation of the human race. The bacteria are delicately susceptible to change of environment. The slightest difference in soil, amount of oxygen, temperature or moisture will destroy millions and inhibit many thousand more; change these conditions for them by applying cold in the form of ether spray. Two conditions are absolutely necessary for germination and development of bacteria—a definite amount of heat and a definite amount of moisture. Both must be present in a suitable amount. The requisite amount of heat minus moisture, or of moisture minus heat, is in neither case favorable to the bacterial development. We take advantage of this knowledge and apply ethyl chloride spray or ice pack. Dividing line between incipient and ultra incipient or progressive abscess. If patient's suffering is of scrofulous, tuberculous or syphilitic diathesis, or is suffering from malaria, diabetes, mellitus or albuminurea, the acute inflammatory process will run a rapid course, so rapid that a speedometer could not register it. Having located the cause, wash canals with

recently boiled peroxide, introduce 5% solution of cocaine into each canal, place a pledget of cotton saturated with cocaine in the pulp chamber, place the positive cataphoretic electrode in the cotton, direct the patient to hold the negative electrode in his hand, turn on a few milamperes of current. The cocaine will be spread through the infected area and pain subdued. Then remove the saturated cotton and dry the cavity and replace with a pledget of cotton saturated with a 15% solution of iodide of potash. Now reverse the current so that the negative electrode is imbedded in the tooth. The iodide of potash will be partially decomposed, free iodine liberated to infiltrate the infected area, inhibiting bacterial action and stimulating circulation and assisting the forgotten human germicide, the blood serum. There is no hard and fast law governing treatment of each and every case. In children the periodontal membrane is thicker than in adults, and the same treatment will not produce like results. Leucodescent rays of the purple light are not very efficacious for children, but give good results in adult cases. For emergency cases, leaving to catch a train, I supply a number of wax plasters charged with cantharides. Take a piece of sheet wax, one and a half inches long and one inch wide, make a basin depression in the centre and place in the counter-irritant, fold the margins together and puncture the wax on the opposite side so as to give a strainer effect. The wax applied on the infected area will supply the treatment and protect the tissues of the cheek. An iodine sprayer has been devised by a German physician that permits the free use of iodine and eliminates all danger of discomfort and bad results through the violet caustic properties it possesses in its soluble form. Surgeons have been forced to use the utmost care with iodine in the past, because the alcohol with which the solution is made contracts the tissues and the liquid decomposes, forming a caustic that is externally painful, so much so, that an incipient abscess which might have resolved has the added complication of a destroyed tissue area. This danger is eliminated by applying iodine in a gaseous form at a high temperature. Air is heated by being pressed through a platinum coil, heated with an electric current. Passing through the iodine container, directly in front of the coil, the air evaporates the chemical, and the whole is forced through a little platinum screen and out the nozzle of the instrument in the form of a spray. The instrument is small and easily handled. The history of methods for treating incipient abscesses lies in the future, not in the past.

Dr. Webster: There is one treatment that perhaps has not been noticed, and as soon as you have made out that the pain is due to pressure, there is no good reason why cocaine should not be injected as near as possible to the apex of the tooth, and an incision made and a burr drilled right through to the apex at once. There is no good reason for not doing that at once, and many times you will get relief from immediate pain, and drainage will be good

anyway. Many times you find it is absolutely impossible to open the root in the sore condition of the tooth, and it is the only way of getting relief. Keep it open and relieve the pressure. One of the best things to do is to use a fine trephine which will cut a circular piece of tissue right out, so that it will not heal up too rapidly.

Dr. Price: The treatment that Dr. Hill has referred to has been used, and quite successfully and very happily to the patient. He did not in detail describe how the cocaine was removed from the tooth and potassium iodide inserted instead. It must be passed up through the roots, and I have frequently tested with litmus paper and found after the potassium iodide had been under the influence of the electric current for some time we had potassium remaining in the cotton to quite a condition of caustic potash.

Dr. Clarkson made mention of a lamp. I was interested a few years ago when a Finsen lamp was displayed at one of our meetings, and I experimented further by taking a 50 c.p. incandescent lamp, fixing it to a bracket and obtaining an X-ray shade which will focus heat and light at one point. A patient presenting himself suffering from neuralgia or the pain of an incipient abscess, or neuritis and so on—some of these cases that are so distressing, and conditions where the patient had suffered long and had become quite exhausted—I put the patient in a comfortable chair, preferably with the feet up on a stool and the head reclining as comfortably as possible, and the only advantage of the Finsen lamp over the 50 c.p. lamp I can see is that it requires to be farther away from the patient, because the heat is so great. A 50 c.p. lamp can be placed as close as the patient can bear, and will produce the desired result. At first the superficial tissue is irritated by the heat and possibly by the rays, but by a little massage the patient can bear considerable heat, and the patient feels so good when the pain is going away. I have had it where, after an application for 20 minutes, the pain all subsided and did not return. In some cases where the pain returned afterwards the patients called off their own volition for relief. I would advise a 50 c.p. lamp. The ultra-violet rays or the rays that have any therapeutic value are not only superficial and deep, but stimulate the circulation and enlarge the capillaries, reduce the pressure and relieve the pain.

Dr. Husband: This is one of the features of our work that is probably more trying than any other in so far as we have the thanks of the patient at stake. I have always run up against these incipient abscesses which have caused great pain, and I have tried all the methods perhaps that have been mentioned, with the exception of the one mentioned by Dr. Price, and yet none of them have given relief. I have tried the method suggested by Dr. Webster, without relief. I don't see that we can look for relief necessarily from relieving the pressure of the bone structure. Let us take an analogy. If we have an infection in any of the soft tissues we

cannot get relief except by applying heat as the essayist has spoken of, so that I mention this so that any who have not tried this must not expect in all cases to get relief. There is a little agent that I have found has given relief when all of these have failed, and that is a prepared cotton which is on the market; it is called thermogen. I do not know what it is saturated with, but that agent comes in rolls, and if it is laid behind the ear and under the back of the ear and down the side of the neck, you will get a grateful heat which you will not get from any of the other agents mentioned. It has this additional quality that in the degree to which it is moistened you get increased strength. It is a preparation made in London, England. I want to recommend this to the men that are up against this serious trouble in practice. It is called thermogen cotton.

ROOT TIP AMPUTATION.

THOMAS B. HARTZELL, D.D.S., MINNEAPOLIS, MINN.

Read before the Dental Society of Western Canada, April, 1911.

Has it a place in our practice? Should we use it? Of what value is it?

Wherever you have an abscess that has resulted in the breaking down of the bony tissue around a root end, exposing that root end, you must do one of two things. You must drain the pus resultant from that infection through the root canal, or you must provide surgical drainage through the alveolar process and gum tissue. Now, if that destruction of tissue is beyond the root end, your root canal, if the fluid is fairly liquid, will probably afford ample drainage for the pus accumulated there, and if you use an ordinary good antiseptic such as almost all of us are using, and which I presume it is needless to speak of in this connection, following up your provision of drainage, you will get a good result.

But there is another factor. This pitted, porous root end has become infected, and from the moment that infection exists there is a culture bed which will hold infection indefinitely, and you may get almost healing dozens of times and seal up your root, and in a day or two the patient comes back complaining about the root, or perhaps even condemning you for faulty treatment, and you have the unpleasant necessity in the end of taking that tooth out. Now I have cut the tip of the root ends off several hundreds of teeth. It is true I lose a proportion of them, but I am very, very sure that if I could have a perfect census of all that class of operations I have done that I would show at least 75 per cent. of successful results. In my own college clinics I am doing that operation several times a week. I rarely go to the college but I cut off some root tips, because the boys wish to save the teeth, and I like to do the operation, and I have a nice little place to do it and a trained

nurse to stand by my side and provide everything necessary, and I would rather go into that room and operate than go home to luncheon any time, and the nurse keeps the records, and I have always in every graduating class a number of men who come away from the college with teeth that have been operated upon in that way; and they are coming back to the college from time to time, and only last week one dropped into a clinic and I was doing that operation, and he said, "Doctor, you did that for me five years ago," and I said, "How is it?" He said, "It's all right." That is a common experience, and it is just applying the ordinary principles of surgery to a comparatively small infection. It is an easy operation to do, and can be done with a local anesthetic, and the safest one I have found, and the most satisfactory, is Phiflin & Co.'s (New York) alypin. I cannot remember the long chemical formula. The alypin solution has proven absolutely harmless in our clinic, and we use quantities of it.

Now then, what are the essentials of success in that little operation for draining an abscess? Very briefly this: You must maintain the drainage until the wound heals from the bottom. If you cut off a root end you should leave the opening as large as possible and not injure adjacent roots. In preparing your teeth for an amputation always get as near perfect sterilization of the root canal as you can. There isn't any place in the human economy that I know of where that word "sterilization" applies except in root canals. You cannot sterilize any other part of the body, but you can a root canal, because you can use fluids or agents strong enough to kill all bacteria. You can use pure sulphuric acid, with a platinum broach, and neutralize it with pure sodium dioxide, and I don't believe you could get any cultures from a root canal thus treated. Having done that, and washed out the two, take chlora-percha and drive it in firmly, and seal it up. Always put in the root canal filling first, because if you cut off the root tip first it will be difficult to make a successful root filling; but if you fill the root canal first and then cut off the root tip you will have a clean, oval surface. I had a great many failures in the beginning because these wounds heal up so rapidly; they become bottle-shaped and hold infection and really look to be all healed on the surface when they are not. I have experimented a good deal with a variety of dressing materials for these wounds, and the most successful one is sandrac varnish. Many of you may use it now. If you haven't used it, try it. Just take cotton and saturate it in sandrac varnish and carry it home and then stroke it down with the wet end of your finger, or press the patient's cheek against it firmly. That dressing will stay there two or three days. If the wound is deep and you wish to avoid the irritation of the hardened plug of cotton and sandrac varnish, or if you wish to vary the dressing, you can substitute another dressing for a day or two, and that is simply cotton saturated with vaseline and aristol, which

makes a splendid dressing which has enough of the iodine principle in it to be antiseptic and stimulating. You will find oftentimes, if you keep re-dressing that wound with your plug of cotton and sandrac varnish, unless you are careful to shorten the dressing, that you will actually prevent healing. One of my boys called me in and said, "I have been treating this case just as you taught me in the college clinic, and it doesn't heal." I said, "My dear boy, is that the size dressing you use every day?" He had put in the same-sized dressing every day and had held that wound there and hadn't given it a chance to heal.

Iodine is the most valuable drug I have in my work. I use it to sponge out these cavities—the $7\frac{1}{2}$ per cent. solution. In the greatest surgical clinic in the world, Rochester, Minn., a few miles below Minneapolis and St. Paul, they are now using iodine to prepare the skin for capital operations instead of the old method of bichloride of mercury and ether. They simply sponge the skin with iodine solution, and they find that iodine really is the best drug to use to get an aseptic field of operation for capital surgery. Therefore, if these wounds are particularly unsatisfactory and badly infected, swab them out with iodine and dress the wound with aristol, which has the iodine principle. You can change these dressings about every second or third day, or you can allow the inbuilding tissues, if the wound is wedge-shaped, to push them out themselves, and in shaping the external wound you will find it of the greatest service to make the opening as broad as you can and allow the mucous membrane to follow down into the V-shaped opening rather than wait for the complete filling of the wound with granulation and subsequent tissue. The broader you can make that opening to do the root tip amputation without interfering with the roots of the adjoining teeth the more rapidly I find it heals.

I think those few points practically cover this ordinary operation, and I hope you will try it and find it of some value. I haven't the slightest doubt many of you are doing the operation now.

Now, the instruments for this work. I am using a trephine No. 7 to remove the mucous membrane. If you use a knife you must have it very sharp, and even then you will find it difficult to cut the tissue away from the bone on which you wish to operate, and if you simply make a slit you have to crowd it open, and the tendency to heal over before you are ready is so much greater and more difficult to overcome; whereas, if you take a trephine and allow it to cut out three or four buttons of tissue in a row, you have exposed the bone to operate on, and have left an opening easy to dress, and which does not require a lot of pressure on the dressing material to hold the wound open. To enlarge the wound after you have opened it, a burr (?) of this size (indicating), that

you can swing back and forth and make the wound V-shaped, is very useful.

Now, gentlemen, I know the hour is late, and you are tired, so I will close.

President: I will ask Dr. Callum to open the discussion on this address.

The first subject I have noted here is with regard to high pressure. With regard to the instrument that Dr. Hartzell had on view there, for cavities that had been already exposed and decay had started, how would you use that instrument? In the case of a cavity that had about two-thirds of the occlusal surface removed?

The next question: How are you going to know how far the drug has extended? In the case of an anterior tooth and in the case of a posterior tooth?

Then the next subject is root tip. The first question I wanted to ask Dr. Hartzell is this: In the removal of a tip, these instruments that he has displayed, will they remove the end of each and every tooth, upper and lower, and how do you go about to locate the proper point in order to insert these instruments to discover where the location is?

President: The paper is now open for general discussion.

Dr. Bush: Mr. President,—I will not keep you many minutes. I do not propose to discuss the article given by Dr. Hartzell. We have surely had an intellectual treat this afternoon, and, as I say, I do not propose to discuss the lecture given by Dr. Hartzell, couched in such splendid language. I merely rise to offer my congratulations, and also to make a suggestion, one which I believe I made at the last meeting of the Odontographic Society, and that is that all the formulæ and preparations used be taken down by our stenographer, and that they be repeated on the multigraph, and that each member here present get a copy of it, so that they will not have to occupy their time taking notes of the different preparations, but will be able to devote their whole time to watching the clinics or to listening to the lectures, and in that way many of us who are too lazy to take the notes will not have to depend on others for the formulæ.

Dr. Croell: May I ask Dr. Hartzell if he could give us any information with regard to the satisfactory results or otherwise of the use of Dr. Joseph Head's preparation. If he has used a solution of acid with a view to dissolving the serunal deposits about the roots?

Dr. Campbell: Mr. Chairman,—I have very little to say except to express my great pleasure in having heard the splendid address of Dr. Hartzell.

Dr. Webster: Mr. President and Gentlemen,—I cannot let this opportunity go without having said a word or two in connection with the admirable address which has been given us just now. To follow closely through that maze of work which he went over just

now was a pleasure to me. I am sure you were all struck with the easiness with which you can remember just what he said. The plan was so clearly placed before you. Any person here who has followed what Dr. Hartzell has said could write a plan now, an outline of it, and fill it in, I am sure, from memory.

It is a great pleasure to sit and listen to a teacher of the capabilities of Dr. Hartzell. There are a few things, perhaps, that we might mention in connection with the amputation of roots, which Dr. Hartzell did not think he had time to mention. In the first place, for the beginner, as was asked by one of the gentlemen, how shall we decide in what cases we shall use the amputation method, and how shall we decide where to make the opening, and so on? One of the greatest aids in that particular is the X-rays. If you can get an X-ray photograph to begin with the first few operations you have to make, it is of the greatest advantage. I shouldn't give a clinic without having the X-rays. I should operate privately, of course, but to give a clinic, I would like to have the X-rays always. Then I know what I am going after.

The next thing is the question of anesthesia. My first operations were made under local anesthesia, and they were not very well done. I had in mind always the condition of the patient, the possibility of causing pain, and the sense that one has of the patient probably moving and doing things that you do not like. I prefer always, where circumstances will permit me, to use a general anesthetic, and to give attention only to the operation, having some person else to administer the anesthetic.

There are many of these cases which may be operated upon and relief given without the actual amputation of the root. Some have the idea that in every case it is necessary to actually cut a piece right off the end of the root and bring it out and see it, four millimeters in length. That is not always necessary. Some of these cases are very obstinate from the fact that was so ably pointed out by Dr. Hartzell, that the surface has become eroded in that way. Now it is quite useless to put antiseptics or disinfectants into that canal and expect to do anything with that kind of surface. That is just wasting your time. You might just as well be prepared, from the history of the case, to clear off the end of that root. Now, it isn't necessary to just cut it off. You will get many great successes without doing it. In every case, remember, you will not get success, but after a little experience you will know when to do it. The tendency will be at the beginning of these operations to make such a fine little opening and think you are going to fish around and do something. You won't do very much, but get a good opening, and then carry the burr over that surface and do the planing act which Dr. Hartzell so beautifully expressed and explained to us in connection with pyorrhea. Get a perfectly smooth surface over it if you can, and, of course, get as much off the end as you can in the operation and don't depend upon the

burr doing all of this; take the planing instruments and go in around after you have a good opening and scrape the end of it off; scrape it all around, and be sure it is all cleared off. Now, those are the cases that haven't been very chronic that you may treat in that way, but the really chronic case which has lasted some time—cut it off and be done with it.

Now, the question of filling the root before the operation or after the operation. In some cases I prefer to fill the root after the operation, and it may be a week after and it may be two weeks after the operation, according to the conditions present. If you have made up your mind that the amputation is necessary, you might just as well make the amputation, and then make the sterilization and have a means of washing out. If you are able to see the end of the root, you can fill it all right. Now, trim it off afterwards. You can fill it first in this case. You can get a good root canal filling in this case because you can see it.

There is a good deal to be said in connection with the packing and knowing when to stop packing. You can go on and pack and keep the thing open for three years if you wish, and then you can let it close up and become reinfected, and you can allow the tissues to become of a glossy surface, and it will never heal. Then you need the iodine. Touch it up with iodine; then it will heal.

Q.: How about carbolic acid?

Dr. Webster: Very good; it will do all right, and be less painful than the iodine, but the iodine has a special therapeutic effect there, so that it is generally recommended for that purpose.

One of the very useful things for these packings is Beck's paste. I have operated many times, cutting off one, two or three ends of roots right in a row, and packed that until it was healing fairly satisfactorily and then used Beck's paste. I have two cases at the present time in which I have used Beck's paste, squeezed in, and I believe that inside of a month they will be in a fairly comfortable condition, without reinfection.

Dr. Wright: Mr. Chairman,—I notice that one of the authorities states that probably 50 per cent. of tubercular glands in the neck are infected by way of the teeth. I would like to ask Dr. Hartzell if he believes that percentage is too high.

Chairman: I will ask Dr. Hartzell, then, to close this discussion.

Dr. Hartzell: In regard to the question asked by the first speaker—drug extension. I make it a rule in bringing about a pressure anesthesia to administer one or two drops after anesthesia is apparent. For instance, if I have injected a pulp and the patient says that there is no longer pain—this particular instrument with which I was working a moment ago is supplied with a ratchet, you see, and when you begin to inject you can hear a little click. Each click represents a drop, and I usually administer two of these after I can penetrate the pulp with a broach; that is

usually enough, and that is something of a guide. The only other way you can know is gained through experience, having injected a sufficient number of pulps to gain some little idea of how much fluid to use, with a solution of a given strength, and attempting the use of the broach on your pulp. Now, I am talking about a pulp removal, and if you put the broach in and the patient flinches a little bit, make the connection with the point of your instrument again and throw in one or two minims, and then proceed as before. These elements in the technic of the operation soon come to you if you have the opportunity of trying them out.

Of course, in attempting to cover so much ground as I have tried to do here, I feel as though it were incumbent on me to hurry, and perhaps I may have left out some things that I otherwise would have said, because I realize very fully that I might have devoted an hour to each one of these topics, but I am sure you would have been very tired and would have wished me to stop long ere I did.

Now, the point of approach. If it is a pulp removal, use a point just above the gum margin; the more centrally you can approach the pulp the more rapidly you can anesthetize, and if it is to make a cavity preparation, then use a point in the cavity that is near the pulp, but sufficiently far away to not run the risk of penetrating it; or use an external opening beyond the cavity margin and fill that with a filling material after you have completed your anesthesia. You have thus two ways of getting at it. I prefer to use the cavity itself wherever possible, because it doesn't open up a new point for possible caries external to the cavity already involved.

Now, in regard to the apex of the root, mentioned by both Dr. Webster and my friend to the right, whose name I forget for the moment, I would say that I never felt it incumbent upon me to remove a root tip and expose it to the patient.

Another thing I neglected to show you was that series of pear-shaped burrs used for the purpose of rounding off these root ends, and instead of attempting to cut the root end off and draw it out, I simply take the burr and swing it back and forth across the end, and a burr of this type very rapidly takes down that root tip, and you have the cavity rounded out in a nice, clean, aseptic way in a moment of time.

In regard to the necessity for general anesthesia for this operation, I fancy if my professional brother felt it was necessary to do a general anesthesia every time this operation was performed, few would attempt it. With alypin deeply injected, which leaves no after-effect, so far as I can see, you can procure an anesthesia that will enable you to take off the root tip or to curette a pocket, if you make two or three injections around the field of operation and your patient does not complain. It isn't always possible to do this if you have a large amount of inflammation and there has been an

infection there which has spread out in the tissues and the tissues have become tense and tender. Of course, then you will need the general anesthesia, but in a large percentage of the cases you can do it with a local anesthesia, and do it successfully, and you will not excite the patient with fear as you necessarily will do a great many of them if you say, "Now, I must have a general anesthesia and put you to sleep," because it certainly is much simpler than an ordinary extraction.

Now, regarding the X-ray suggestion. It is excellent, but there enters another element which is a deterrent to the patient. If you have to have an X-ray picture for every root tip you deem necessary to operate upon, many of these patients will prefer to have the tooth extracted. Though I do not know what the fee of the man who makes your pictures for you is in this city, but anywhere from \$10 to \$20 is the usual fee, and many of our patients would feel that precluded the advantage of this operation.

Now, you can judge where to make this opening by having explored your root canal with a slender instrument, and with the finger ends located the root end as nearly as you can, and then measured the depth of the root canal with your root canal plugger or broach. Then draw that out and lay it upon the tooth and estimate in the gum tissue about where the opening should be. Having done that, then make your opening very broad and advance your operation with the small-sized burr first, which will penetrate to the root and allow you to feel up along the root, as the burr will, because the root is very different in texture from alveolar bone. Having reached the end, swing the burr backward and forward across the root until you have just opened it up large enough to take a burr of a larger size, and in a very few moments you are usually able to do that operation in such a way as will give you a good result, and there is no fee to pay but yours, instead of \$20 to the X-ray man. Whatever you deem your services worth the patient will be willing to pay, while, if he had to pay the other fee, he probably would prefer to lose the tooth.

Now, I fully agree with Dr. Webster that the X-ray picture is very desirable, and if you can have it, by all means do; it is the right thing, but you can do the operation in many of these cases—the great majority of them—without the X-ray picture, if you wish.

The question asked regarding Dr. Head's solvent is germane. I had a paper which Dr. Head wrote and read at the Columbus meeting of the Ohio Dental Association some two months ago, which he gave to me after the meeting, and I have talked to Dr. Head regarding the tartar solvent, which is ammonium-fluoride, and have used it, and in certain cases it is valuable, but I find that it is rather painful when injected into the pocket. It always causes some pain, and while it softens the deposits it does not remove the pitted root surface, and the cases that have been

treated with tartar solvent alone usually have recurrent infection of the root surface. At least that is my experience: perhaps I haven't an open mind. You know that most of us who get an idea and work it out to a successful issue get the feeling by and by that that is the only way of doing things, and I may not have that open mind, but I certainly have had reinfection with cases that have been treated by the tartar solvent alone, where, if I had removed the pitted root surface, I would have removed the culture bed and thus prevented reinfection. I think the tartar solvent makes the work of removing the serumal calculus somewhat easier, because it certainly does soften that material and renders it somewhat easier of removal, but as far as being a permanent cure and leaving the teeth in the best possible condition afterwards I cannot agree with Dr. Head.

Dr. Webster: What about hydrochloric acid in connection with the planing for the purpose of softening the surface of the teeth?

Dr. Hartzell: I think it would answer the purpose, although I never have tried it, Dr. Webster. I have used lactic acid a great deal, but I find this to be the case, that if you remove all the infection and wash the pockets out with warm water you have done all that is really necessary. These powerful drugs are not essential to gaining relief from that inflammatory state. In fact, they create some inflammation by their mere presence there. If you can get rid of the infection and wash the pockets out clean, the irritation you have procured by passing your planes in and out of the pocket is usually entirely sufficient to cause an abundant out-pour of granulation to fill any space that may have been created by loss of bone, and you have no subjected the patient to the irritation of powerful drugs.

Now, regarding pyorrhea pockets as a door of entrance to the tubercular bacillus and the causing thereby of tubercular glands, I would say this, that I have never found tubercular bacilli in the pus taken from pyorrhea pockets except in those cases where pulmonary tuberculosis has existed. You will find a very able article written by Dr. M. H. Fletcher, of Cincinnati, Ohio, read before the American Medical Association last year, and also read at the Tri-State meeting of Indiana, Illinois and Ohio, I believe, at Indianapolis, two years ago, and published in the proceedings of that Association, in which he says that this rarifying inflammation which we designate as pyorrhea, and which he designates as alveolitis, is primarily a tubercular condition, or at least it has all the evidences of a tubercular condition: the pathological lesion resembles, in his opinion, the tubercular lesions, as illustrated by many of our pathologists: but after reading that paper and discussing it at that time, I have been taking especial pains for the last two years to make examinations for tubercule bacilli. It is a very easy examination to make. The greatest amount of time is spent with the microscope itself. You can take the smear and

make the stain in five or eight minutes, although it takes a good while to examine the slide. You may have just one or two baccilli, and you might search with a 16 objective and an oil immersion lens for a good while before you would happen to strike that one bacillus, but still it might be there. I am inclined to think that we do not find the tubercular baccilli as an intitating factor in this condition, and whether or not tubercular baccilli enter in the case of tubercular glands or not, I am unable to state from actual observation. All I can say is that I have not found them in a mouth or in the pus from these pockets, except in those cases where a clear diagnosis of pulmonary tuberculosis existed prior to examination.

Now, I think I have nothing further to say, except to thank you, gentlemen, for the most delightful reception you have given me, and to answer any questions that you may see fit to put to me during the clinic which I am to give to-morrow. I want to express my keen appreciation of the good time I am having here.

NECESSITY FOR DENTAL EDUCATION OF THE PUBLIC

BY W. C. DAVY, D.D.S., MORRISBURG, ONT.

Read before the Women's Institute, Morrisburg, Ont., Sept., 1911.

Mr. President and Ladies,—Your invitation to be present to-day and have something to say to you about the teeth was welcomed with much pleasure. I felt myself honored, but was most gratified by being able to be one of the large number of dentists throughout Ontario and the North American continent who are endeavoring to assist in the campaign of dental education of the public.

Ladies are generally interested in philanthropic movements and the educational committee of the Ontario Dental Society is appealing to the Womens' Institutes throughout the Province as one of the most fruitful sources of assistance in creating a public sentiment in favor of this great work which is still in its swaddling clothes.

The work is so new, so vast and requires so much detail that as yet only parts of the machinery have been able to be put into operation while other sections are still in the process of formation, and it will probably be some time before all the wheels of this industry will be working harmoniously producing better, happier, healthier citizens.

I come to you to-day to give you some idea of what is being done on this continent and especially in Ontario to protect our people and save our growing young from that deterioration which is bound to be a logical sequence of neglected teeth and oral cavity; to show you as far as time will permit what that deterioration is and how it is brought about, and some of the remedies.

Reading a large number of dental magazines one cannot help being impressed with the great efforts to-day being put forth by dental societies throughout the continent to practice preventative dentistry and secure the assistance of the public in those efforts. No brain storms, no ephemeral hallucinations, no mirages have been the foundation for this campaign. Its base is the adamantine rock of facts based upon observations and examinations and improvements made by careful, conscientious treatment.

Dr. Osler has said "that decayed teeth have caused more deterioration in men than alcohol." Let us first take a few figures to show conditions as they are. Recent examinations made in the cities of Cleveland, Boston and Toronto revealed the fact that from 96 to 98% of the mouths of the children in the public schools are in a faulty or diseased condition. 92% of recruits for the German army were found to have defective teeth.

In Edmonton a class of 40 from 8 to 10 years old was examined. 39 of the 40 had decayed teeth.

Reports from New York, Halifax and other large centres reveal the same conditions. It is estimated that 8% of the people of the United States receive dental attention. Having these figures showing the conditions in the public schools we must infer that at least 90% of the people in that great country are in need of dental attention or about 81 million people. I believe our percentage in Canada is not quite so large, it having been estimated that about 20% receive dental attention. Of the number of people who do receive dental attention about 5% take the requisite care of the mouth and present themselves for examination and treatment with sufficient frequency.

These figures before us which might be backed up by a great many interesting statistics we will consider we have proven that the vast majority of our people have mouths in a faulty condition.

What does this condition mean? Quoting from one of our leading magazines we read "Dental caries or decay of the teeth is indeed the most prevalent disease known to modern civilization and is producing more havoc in the human family than all other diseases put together." We are told at least 95% of all tuberculosis infections take place through diseased or ill-kept mouths and what is true of that disease is true of almost all other contagious or infectious diseases. Besides these diseases such conditions as enlarged glands, inflamed tonsils, septic catarrh of the stomach, indigestion, pernicious anemia, deafness and many other vicious conditions are directly or indirectly traceable to unsanitary mouths. Deformed faces handicapping the individuals for life is another result while decreased mental capacity has been proven beyond doubt.

In the famous Marion School Dental Squad of Cleveland, a class of 27 was taken and after a year's careful training in proper care and use of the teeth the average increase in working efficiency

was shown to be 54%. The committee of the National Dental Association of the United States, the largest association on the continent, carried out these experiments and estimate with the average school child that his working efficiency would be increased 20%. Think of that! One year saved in five besides the increased physical and moral condition. Moral condition! yes, undoubtedly so, experiments have proven it.

Let us endeavor to show why these conditions bring about such direful results. Two of the main uses of the teeth are (1st) mastication, (2) to give expression to the face. Horace Fletcher who believes in a healthy psychological condition of the mind with a proper use of the teeth and a consequent proper mastication of food ingested has shown as a sequence properly developed and controlled appetite, reduction of food consumed, less wear and tear on internal organs and increased efficiency in those adopting his methods. Many of you take the Ladies' Home Journal and keep it on file. In the September and October numbers of 1909 you will find an excellent article by Mr. Fletcher.

Of primary, secondary and final importance to the proper mastication of food is a sound physiological condition of the grinding and triturating apparatus supplied by nature in the tooth organism. Food must be finely mascerated and insalivated in order that it may be properly digested in the stomach, absorbed in the intestines and assimilated by the body tissues. One sore tooth will prevent this process and as a result the pernicious habit of bolting the food is established. As a consequence we find young dyspeptics, youthful bodies improperly nourished, incapacitated mental organs and deteriorated adults to be thrown out on the world with contracted disease to propagate families with their inherent constitutional tendencies to further deterioration, decline and physical, moral and mental extinction.

Having discussed the proper mastication of food now let us show how so many diseases are introduced by means of an unsanitary oral condition. That most diseases are propagated and developed by means of germs is a universally accepted theory and fact to-day. These germs require heat, air, moisture, a proper medium and food. Without going further into the bacteriology please accept the statement that all these conditions, or most of them, are generally found in the uncared for mouth. While we are in a healthy condition the blood corpuscles, the scavengers of the body, can possibly take care of those germs and their by-products, but like the thief in the night their opportunity arises when the body vitality is lowered by fatigue, exposure, etc., at which time our little scavengers are busy building up this depressed bodily condition. Then it is they get a chance to multiply and the result is that we discover that we have contracted some disease. If many of us knew the number of germs of pneumonia, typhoid, etc., carried out with us in a year we would be greatly alarmed. Such,

however, is the case, and germs of diphtheria, scarlet fever, etc., have been known to exist in mouths of people for years after they were supposed to have been cured. Not long ago in one of our cities an epidemic of typhoid broke out in a certain section. Tracing every possible source of infection it was found that the milk in that section was supplied from one source principally. The health officer visited the dairy and found that one of those handling the milk had recovered from typhoid some years before, but on examination at the hospital was found to be saturated with the typhoid bacillus and while not affecting her health the disease was communicable to others.

The mouth being such a reservoir for the reception and development of the germs of disease we can readily see how essential it is that it should be kept in a sanitary condition. No woman would think of having her home beautifully decorated, polished floors, dainty rugs, everything absolutely clean, and allow the front entrance to contain several inches of mud and filth. A clean house would be an impossibility under those conditions. A clean body cannot be maintained and allow the vestibule, the mouth, to be filled with noxious, fermenting, germ laden filth to be mixed with the food and carried to the stomach, there to interfere with functional nutrition and poison the entire system.

Dr. D. D. Smith, one of the foremost men on the continent in this matter of preventative dentistry says "Enlightened, intelligent dentistry will yet supply the missing link in the medical treatment of tonsilitis, many throat, ear and stomach troubles, indigestion, gastro-intestinal disorders, diabetes and possibly assist in the treatment of epilepsy and cancer."

Can dentistry do such wonders? Undoubtedly so. Our journals are constantly quoting evidences of the fact. An instance read the other evening would probably interest you. A wealthy lady was consulting no fewer than six medical specialists with no avail. She visited her dentist who found her mouth in a wretched condition. She desisted in her visits to the specialists and had her mouth put in a sanitary condition, resulting in a perfect restoration to health.

Two cases from my own practice give somewhat similar results—a medical man referred a patient for treatment. Her mouth was in a terrible condition. After being carefully treated and doing careful work herself as instructed, she was lost sight of for a year. I saw her husband one day and asked him how she was, his reply was: "Before she had her teeth looked after it seemed a doctor was in the house half the time, but since then we haven't had any need for one; she is a different woman." Case 2—An anemic run-down woman presented; decayed teeth, old roots, swollen gums, loose teeth, and the worst conditions possible existed. A medical man was in attendance almost continually. I have observed that lady for the past two years since treatment was administered. She has

a good complexion, has gained in weight and looks ten years younger. Only this morning I asked her husband how her health was and he replied: "She was never better in her life and it all started with having her teeth looked after."

Let us now consider as briefly as possible what should be done to prevent and correct these conditions.

The infant whose nervous and digestive systems are so finely balanced should be left largely to find its own pleasures. The young kitten, lamb, etc., find their own exercise sufficient without any coaxing, so should the infant. Over attention, dandling, excitement should be avoided. The mouth should be carefully swabed out after feeding, avoid comforts, thumb and finger sucking, etc. The food should be such as prescribed by such eminent specialists as Dr. Holt.

From the time of the appearance of the first teeth they should be carefully cleaned and so soon as the temporary dentition is complete regular visits should be made to the dentist.

Christmas comes Dec. 25th, Dominion Day July 1st; Easter is a movable festival. The child's visits to the dentist should not be a movable festival, but should be placed on the family calendar as dates just as fixed as our stationery holidays. These dates become habitual and will probably be kept up through life.

The temporary teeth should be filled, any irregularities corrected. Proper instruction will be given regarding the cleansing of the mouth, return visits, etc., by the careful dentist.

If time permits from these charts we will see why these teeth should be maintained to prevent irregularities, to give proper development to the jaws, and to allow nature to normally and harmoniously supplant the temporary dentition with a permanent one.

The proper cleansing of the mouth should be as follows: Brush the teeth before retiring. This is the most important time, as during the hours of sleep there is greater chance for fermentation and the bacteria, causing decay, are left quiet to carry on their nefarious work. Next comes the morning cleansing and then to complete the work the tooth brush should be used after each meal. Use a dentrifice once a day. The brushes should not be too large and should be used on all surfaces of the teeth, brushing from the gum line to the grinding or cutting surfaces of the teeth. Any particles which cannot be removed in this way may be loosened with a quill toothpick or floss silk. Your dentist will prescribe any mouth wash that may be necessary.

What is being done in some parts towards furthering dental education of the public and assisting in bringing the mouths of our public to a healthy condition?

In Germany the examination of school children's teeth is compulsory, and free, or almost free dental clinics have been established.

At Frankfort, in Maine, one million dollars has been contributed, and 40 people employed to look after the school children's teeth.

At Cologne clinics are also opened; in fact there are now 21 free clinics in that country for school children. Dr. Schmidt, of Berlin, says: "Germany is making every effort to build up a strong, robust population. Realizing that the perpetuation of Germany as a great and powerful nation, depends upon what is being done to improve the health of the children in the primary schools."

In Cleveland 120 dentists have promised one week of their time to look after the school children. Free clinics are being established in some of the larger Canadian and American cities and it will not be long before this example will be followed by most of the large centres, and we hope will spread to rural districts. In Ontario pamphlets have been widely distributed such as you have received to-day. Another one is being prepared at present. Lectures are given to nurses in training, to students at our normal schools, at teachers' institutes, womens' institutes, public meetings, etc., examination of the mouths of school children is taking place in some of the cities. Toronto has a school dental inspector (or better named as instructor) also two nurses and is establishing a free dental clinic. Efforts will be made to have inspectors or instructors for the Province to visit institutes of different kinds, school sections, towns and villages. They will deliver lectures and encourage public dental education. It is the aim to have teachers trained so that they may readily detect defects in teeth, hearing, eyesight, breathing, etc., and refer the parents to their physician or dentist. The plans of organization are taking definite form and we hope soon will be brought into operation. One of the great difficulties is the matter of overcoming the ignorance of many parents regarding these matters and creating a public sentiment in favor of such needed reform. Until such a sentiment has been raised and until our better thinking public become convinced and enthused with the necessity for this campaign and demand not only that their own children are properly looked after, but also that the children with whom their own come in contact receive attention to avoid contamination and infection, until such a time our work must necessarily progress slowly, but the time will come undoubtedly when, by legislation, dental and medical inspection of our school children will be compulsory. Not only will inspection be compulsory, but the correction of any defects will be required before the children will be allowed to attend school where their trouble may be transmitted to others.

We look as was mentioned in the first part of this talk for the support of such organizations as yours in this pioneer work. Your influence is great, and your energies cannot be expended in any direction which will reach further towards bettering the tone of our national manhood and womanhood.

Selections

MASTICATING.

W. E. WILLMOTT, L.D.S., D.D.S., TORONTO.

Masticating is generally considered to be merely the grinding of food into small particles, in order to facilitate swallowing and subsequent digestion.

There are other considerations involved, however:—the partial digestion of the food in the mouth; the development of the muscles of the face, thus affecting the expression; the development of the teeth and jaw bones; the development and nutrition of the throat and nasal passages. Mastication is accomplished by the action of the teeth of the lower jaw against those of the upper. In the carnivorous or flesh-eating animals, the movement of the lower jaw is limited to that of up and down and the food is crushed between the very uneven surfaces of the upper and lower teeth: while in the herbivorous or grass and grain-eating animals, the movement is almost wholly sideways, grinding the food between the comparatively smooth surfaces of the teeth. As man's diet consists of a large variety of foods, we find a modification of these two forms in a somewhat uneven surface of the teeth and a very free movement of the lower jaw, forwards and backwards, and from side to side. When food has been taken into the mouth, the tongue moves it back between the posterior teeth, where it is ground into small particles. The movements of the tongue, lips and cheek serve to retain the food in the proper relation to the teeth until it is sufficiently comminuted and mixed with saliva, when it passes backwards and is swallowed. This should not be done until the food is thoroughly masticated and insalivated.

The value of thorough mastication is threefold:

(1) *Mechanical*.—The subdividing of the food into fine pieces is of the greatest value to subsequent digestion. The indigestibility of many articles of food is due very largely to the facility with which they may be swallowed without being very finely divided. While meat, eggs, etc., are very readily digested by the fluids of the stomach when in small particles, a lump of either will resist their action for a considerable time.

(2) *Chemical*.—During mastication the flow of saliva into the mouth is very largely increased by the reflex action of taste and also by the pressure on the salivary glands, of the bones and muscles involved; the flow of the juices of the stomach is also induced. The object of mastication, the trituration and insalivation of the food, is more perfectly accomplished by this action being prolonged and this, "the first process of digestion being thorough, the

succeeding ones in stomach and intestines would proceed with greater ease, with a saving of energy and vitality.”*

(3) *Physiological*, or the effect on the jaws and surrounding structures.—The muscles of mastication are very large in relation to the bony structures in connection with them. The exercise of these muscles largely influences the nutrition and development, not only of the muscles themselves, but also of the important structures near them, such as the jaw bones, the salivary glands, the soft palate, the tonsils and the posterior portion of the throat and nasal passages. The development of a bone depends considerably on the amount of exercise given the muscles which are attached to it. Hence in a person accustomed from childhood to thoroughly masticate, we generally find the jaws large and shapely, as well as the teeth regular, the tongue and salivary glands large, and the nasal and posterior nasal passages spacious and the membranes of the mouth healthy. As the teeth are developed within the jaws they necessarily share in the nutrition and proper development. If these bones are properly exercised during the formation of the teeth the tooth germs will grow and develop more perfectly and the teeth will be more resistant to caries or decay, the best preventative of which is efficient mastication.

The ample development of the jaws brought about by prolonged masticating tends to the regularity of the teeth, thus providing a proper “bite” or the proper relation between the upper and the lower teeth.

Why do the vast majority of people not masticate properly? There are several reasons, the most frequent, possibly, being “soft” or “mushy” food. This is most noticeable in the case of children’s diet. Where the necessity of mastication is lacking, the instinct for it gradually disappears and the child acquires the habit of bolting its food and very soon comes to reject the harder for the softer foods. It is very important for the proper development of the jaw bones and of the permanent teeth that a child should be given food which cannot be swallowed without thorough mastication.

Another reason is some defect in the masticatory apparatus, and this is very common in those who have not learned to masticate properly in early life. The defects may be irregularities in the arrangement of the teeth whereby they do not come into proper relation, the upper with the lower, thus largely diminishing the area of the grinding surface, or the teeth may be decayed or loose and painful upon pressure, or some may be lost. Again, many people hurry over their meals, either of supposed necessity or on account of an acquired habits.

What are the evils resulting from improper mastication? Their name is legion. Possibly the most important is the tendency to take too much food. If the food were of a variety necessitating abundant

*H. Campbell, M.D., F.R.C.P., (Lond.), in “The A B-Z of Our Own Nutrition.”

masticating less would be taken, on account of the longer time and the more labor required, but thorough mastication, even of soft foods, "reduces the amount needful, for the more perfectly the food is chewed, the more perfectly is it digested and the more economically is it disposed of in the system."* An inevitable result of an excess of food or of food insufficiently chewed is a derangement of the digestive tract resulting in more or less serious indigestion or in some cases even in cancer of the stomach or in appendicitis. Again, in those who do not masticate properly in early life the nasal passages and tonsils fail to properly develop, and in later life also, unless mastication is prolonged these parts are deprived of the stimulating effect of increased flow of blood to the parts, brought about by the action of masticating, and hence are more liable to become diseased both in the child and in the adult. There is no doubt whatever that the lack of efficient mastication predisposes the child and the adult to rhinitis, tonsillitis, adenoids and other affections of the throat and nasal passages. "The prevalence of adenoids among moderns must be the result of the modern system of feeding children and the defective mastication which goes along with it."* A sequence of adenoids is "mouth breathing" on account of the posterior nasal passages becoming blocked up. So, also, a sequence of mouth breathing is the predisposition to laryngitis, bronchitis, phthisis, dental caries, irregularity of the teeth, lack of development of the cranial and jaw bones. Another result of lack of abundant mastication is a lack of development of the tongue, salivary glands and jaw bones. The effect on the teeth is very marked. As the circulation in the teeth and surrounding parts is not stimulated, the teeth in infants do not develop properly and after development they are not properly exercised and massaged, while the secretions of the mouth are apt to be scanty and unhealthy. Under these conditions the teeth and surrounding parts are more liable to become diseased. Another result in more mature life is the loosening of the teeth from a disease called pyorrhea alveolaris or Riggs' disease. Realizing the importance of thorough mastication and the evils arising from the lack of such, what should be done? In the first place, the jaws and surrounding parts should be exercised during their development. As soon as an infant shows any disposition to bite hard substances the instinct should be gratified.

At first, a hard rubber ring may be used, but as the time approaches for the teeth to erupt a harder substance, as ivory or coral, may be substituted. It is "better, however, to give the child something which is not only hard but nutrient and pleasant to the taste—a chicken bone or a chop bone from which almost all the marrow has been removed may be employed. These are not quite as hard as ivory and are, moreover, more attractive on account of the taste."* After the teeth have erupted, the child should still have abundant exercise in chewing, for example, hard toast or hard

plain biscuits. Of course other foods will be needful as well, but as this deals only with masticating, mention is made only of the best means to that end.

The same principle should be continued through life, masticating everything thoroughly and at every meal some hard substance.

Once the habit of mastication is acquired the food will not be swallowed before being converted into a fluid. That this habit may be developed and retained through life, it is absolutely imperative that the teeth should be in the proper relation, the upper to the lower; also that they should be free from cavities of decay and firmly fixed in the jaw.

In this connection it should be distinctly understood and implicitly carried out, that every child should make frequent visits to the dentist, and that every one of the first teeth should be filled if decayed, and should be retained in position until the permanent tooth is ready to replace it.

Periodic visits should be made to the dentist by every person and all necessary operations performed in order to preserve the masticatory apparatus in efficient working condition. Even if one or more natural teeth should be lost they should be replaced by artificial substitutes.

In a word, what does efficient mastication accomplish? It divides the food into very small particles; causes a flow of saliva into the mouth, thoroughly mixes the food with saliva, facilitates swallowing, partially digests the starchy foods; excites the flow of digestive fluids in the stomach; develops the muscles of mastication and those of the face, thus affecting beneficially the expression; influences the nutrition and development of the teeth, the jaw bones, salivary glands, soft palate, tonsils and posterior nasal passages; is a preventative, to a large extent, of decay or loosening of the teeth; cures many cases of indigestion.

Surely a sufficient benefit to recompense for the small expenditure of time and labor necessary to accomplish it.

In another word, in what does insufficient mastication result? The food is swallowed before being sufficiently comminuted or sufficiently insalivated; the habit of eating too much; serious derangements of the digestive tract; may induce cancer of the stomach or appendicitis; lack of proper development of the teeth, of the muscles of mastication, of the jaw bones and cranial bones, thus adversely affecting the expression; lack of proper development of the throat and nose, predisposing to rhinitis, tonsillitis, adenoids, mouth breathing, laryngitis, bronchitis, consumption, dental caries and irregularity of the teeth. Surely a great risk to assume in order to save a little time and trouble. —The Public Health Journal.

[The Prevention of Dental Caries, By Dr. J. Sim Wallace, should be read in connection with this paper, see page 492. Editor.]

THE PREVENTION OF DENTAL CARIES.

By J. SIM WALLACE, D.Sc., M.D., L.D.S., Hon. Dental Surgeon to the West End Hospital for Nervous Diseases. Published at the office of The Dental Record, Alston House, Newman St., E. London. 1911.

The author in the preface says "Dental caries is one of the most easily and certainly preventable of diseases, and there would seem now to be no valid excuse for the bringing up of children with decayed teeth, together with all the pathological results which they give rise to. Unfortunately, so far it is only those who have become interested in the subject and who are themselves possessed of the required knowledge to come to correct conclusions on the subject, who know the simple secrets of prevention. That is to say a goodly proportion of the dental profession and here and there a few medical men who have paid attention to the long and laborious investigations which have led to the solution of this important problem. It is with the idea of letting what is already known to a few become more widely known, among medical men more especially, that I venture to publish this pamphlet. Those who find the subject of interest or importance would do well to make their knowledge more secure, by acquainting themselves not only with the outlines of the means of preventing the disease as presented in these pages, but also with at least a general knowledge of the pathology and the etiology of the disease, because for some considerable time, incredulity, ignorance, prejudice, vested interests and the commercial spirit are likely to continue to make a stubborn resistance to the diffusion of the truth. It would be a great service to mankind if a goodly number of medical men would become thoroughly acquainted with the subject so as to rid the land of ideas which are now definitely known to be wrong, and indeed often actually markedly instrumental in causing the disease. Medical men should certainly make sure that it is not their precepts which are largely responsible for the widespread prevalence of the disease. Those who would like to supplement their knowledge may be recommended to consult the more recent standard text-books, e.g., J. F. Colyer's "Dental Surgery and Pathology," or the larger "System of Dental Surgery," edited by Mr. Norman Bennett, about to be published by the Oxford Medical Press. Therein they will find the ground work of the subject sufficiently thoroughly treated to let them master all important points. The references at the end of this pamphlet will also help anyone with regard to any special point on which he may desire to have further information.

ON THE MEANS OF DISSEMINATING KNOWLEDGE NECESSARY FOR THE PREVENTION OF DENTAL CARIES.

From what has already been said it is obvious that the cleansing power of true or effectual mastication is better almost beyond com-

parison than artificial cleaning. Efficient mastication not only keeps the teeth clean and free from injurious plaques of bacteria, but the gums are kept clean, healthy, firm and so finely applied to the necks of the teeth as almost to defy the lodgment of all appropriate kinds of foods. The peridental membrane and alveolar processes are kept strong and healthy, and no doubt the gingival organ is likewise benefited. The bones of the jaws also are stimulated in their development, and the teeth are more perfectly implanted and regular than when mastication has been insufficient, and artificial cleansing has been solely relied upon for their welfare. Moreover, digestion and the general health are both directly and indirectly benefited. It is, therefore, the obvious duty of every dental practitioner to instil into his patients the value of efficient mastication, and to get them to understand that no amount of artificial cleansing will make up for the continual transgression of the dictates of physiology, and that this is doubly important with regard to growing children whose habits have yet to be formed. It is hardly necessary to say that the attempt to teach the art of vigorous mastication is *perfectly futile* unless the food is of such a consistency as will stimulate or require it. From Dr. Black's Phago-dynamometric records we observe that the vigour of mastication *is and must be* proportional to the consistency of the food consumed, if the food is masticated at all. Here, however, we are met with a difficulty, for if medical practitioners advocate soft food for children, as in actual practice they very generally do, and the dentist advocates its discontinuance, then the diffusion of the required knowledge is greatly impeded. As the general medical practitioner comes in contact with children at a much earlier age than the dentist does, great havoc may be wrought in children's mouths and teeth before the advice of a dentist may even be thought of. It is, therefore, obvious that medical men must learn or be taught how the mouth may be most effectually kept clean. There are few indeed who realize that the mouth is, or at least ought to be, much cleaner after a meal which really requires mastication than at any other time. The detergent effects of the foodstuffs have admittedly been overlooked. It is not so very long since the idea that a meal invariably left the mouth dirty was generally believed even by dentists, so that we can hardly expect the public to be converted at once to the idea that the meals themselves should be cleansing to the mouth and teeth. It is not too much to say that, notwithstanding its immense importance from the point of view of general health, the natural hygiene of the mouth has in the past to all intents and purposes been entirely overlooked. It is true that artificial cleansing of the mouth has been insisted on, but that some foods leave the mouth physiologically clean, while others leave it dirty, seems never in any text-book of dietetics to have been so much as mentioned. Foods which lodge about the teeth and do not clean the mouth, have been recommended with-

out the slightest concern as to whether they kept the mouth, and indirectly the alimentary canal, free from chronic fermentation, so long as they were known to be easily digestible and to supply the requisite amount of proteid, carbohydrate, etc. In fact, the viewing of food from its nutritional and not its hygienic value is still a matter for serious regret among those who understand the value of oral and indirectly alimentary hygiene. Thus in reviewing an important medical book¹⁸ recently published, the "British Dental Journal" said, "We are at the outset pained to find that wherever a dietary is given in detail in this work, as being specially adapted for school children, no thought apparently has been given to the fact that human teeth are primarily intended for mastication, and that upon the functional activity of the teeth depends the proper development of the jaws; again, we would point out that a diet should be so arranged as to provide a natural toothbrush, and not be composed of those very ingredients which on fermentation lead to the production of lactic acid and consequent decalcification of the dental enamel."³³ It is obvious that the first thing required for the diffusion of the requisite knowledge is to have it clearly taught in text-books for dentists and medical practitioners. We may say that as far as dental text-books are concerned this has just recently been done,⁹ and is further about to be done in a forthcoming text-book,² and from what we can gather, what is being done in England to-day will, in the course of time, be done in other countries. With regard to medical text-books, unfortunately the importance of the subject has not yet been fully realized by all the writers. Some, however, have recognized the more modern teaching of dentists, and further have advocated an abandonment of the current practice of pap feeding for children,⁶ not only on account of the teeth, but because of harmfulness with regard to the alimentary canal³⁶ and body generally.³⁸ Notwithstanding this, however, it would seem desirable that more attention should be paid to the hygiene of the mouth by medical practitioners, and only good would result from requiring from medical students an elementary knowledge of the principles of oral hygiene. Moreover, fuller recognition of dentistry as a branch of medicine at the universities where medical degrees are granted should be demanded. All this is important because the subject of oral hygiene is necessarily associated with questions of dietetics, and consequently in this matter it is to the medical profession that the public look largely for guidance. As regards the dental branch of the profession, it has been and is doing excellent work so far as that is possible under existing circumstances. The British Dental Association and the School Dentists Society, have made statistical investigations which have done much to awaken both the medical profession and the public to the great importance of the subject. Here it is hardly necessary to say that the treatment of school children's teeth should always be accompanied by instructions as to the prevention of the

disease which will be effectual. Otherwise the chronic irritation of increasing rates, and the almost certain recurrence of the disease within a few years will most assuredly give rise to the suggestion that such treatment is not initiated by the highest motives. This would be a great misfortune, because the treatment of school children's teeth is itself of importance in preventing further caries. It makes the children able to eat food suitable for the hygiene of the mouth and alimentary canal, together with all its concomitant and consequent advantages. From what we have just said it may be observed that the best means of educating the public is through what may be called the recognized channels; that is to say, those with special knowledge must expound the subject in such a way that the leaders of medical thought and writers of text-books shall become acquainted with the truths, and when this is done there is but little fear but that the truths will gradually become generally known. The public have always looked to the medical profession for guidance, and there is no higher authority to whom they are able to appeal, and therefore no efforts should be relaxed, either in regard to perfecting the knowledge of the medical practitioner in this special branch of learning, or in bringing before his notice the reasons for considering the hygiene of the mouth as the most important part of preventive medicine.

FOODSTUFFS AND DENTAL CARIES.

NOT CLEANSING AND LIABLE TO INDUCE CARIES.

Farinaceous and sugary food in general without fibrous element.

Examples: Sweet biscuits and cake; bread and marmalade; bread and jam; new bread without crust; bread soaked in milk; milk puddings: porridge and milk; stewed fruit: chocolate and sweets of all kinds; honey.

Liquids: Cocoa and chocolate.

The above foods should not be eaten except when followed by foods of the cleansing kind.

CLEANSING AND PREVENTIVE OF DENTAL CARIES.

Fibrous foods generally.

Examples: Fish, meat, bacon, poultry. Uncooked vegetables, lettuce, cress, radish, celery. Cooked vegetables are as a rule cleansing, but in a less degree than uncooked vegetables.

Stale bread with crust; toasted bread of all kinds; twice baked bread; pulled bread and cheese. Savouries. Fresh fruits, especially those requiring mastication, *e.g.*, apples. Fatty foods, *e.g.*, butter and margarine. Liquids: Tea, coffee, water, also soups and beef tea.

The article on mastication by Dr. W. E. Willmott, Toronto, Canada, and the views expressed in Dr. Sim Wallace's revised edition on Prevention of Dental Caries, make the most complete exposition of the relation of dietics and mastication to dental caries now in print.—Editor.

Dominion Dental Journal

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VOL. XXIII

TORONTO, OCTOBER 15, 1911

No. 10

NEWSPAPER REPORTS.

When one reads newspaper reports of papers and discussions on scientific subjects one should be pardoned for believing that the inaccuracies and misrepresentations are intentional. One may be pardoned for doubting newspaper reports in anything when he reads a report of his own remarks on a specific subject. Some scientific bodies exclude the press because of their tendency to write what is catchy rather than what has really happened. How could one expect an accurate report of a meeting when the facts are so often gathered by the hear-say method? A reporter will rush into a meeting or at the close of a meeting and ask someone what the speakers said. If he happens to strike someone who has a grasp of what was said and who has no axe to grind, he may get an accurate statement of the facts. Then, again, reporters are often incapable of understanding what was discussed, and may as a consequence get into all kinds of errors.

The majority of reporters want *stuff* and they must have it. They will gladly make a good report in preference to a poor one, if someone who knows will take the pains to give it to them. Every dental society should have someone deputed to give all the newspaper reports. It takes years for such organizations to learn to look after the reporting of their meetings. It does not do to ignore the daily press, because it is the greatest educative factor in the country.

The recent report of the National Dental Association at Cleveland is an example of an inaccurate report. At that meeting it was reported in a daily paper that the National Dental Association passed a resolution condemning the use of tooth brushes and mouth preparations. This set the manufacturers of such preparations by the ears. The Association has been, ever since, denying this statement and in every way trying to counteract its influence. Denying a report which was such *good stuff* has little effect. We quote below another example, but of a different kind. This has been largely copied throughout the press in Canada. It gives the names, dates and places as though it really happened. It may be an advertisement for Dr. Richardson, or it may be absolute ignorance on the part of the reporter. We leave the reader to judge:

"Boston, Aug. 17.—An innovation in medico-dental surgery was the operation performed last Friday by Dr. Maurice Richardson upon Miss Carmen LaCorchia, a 17-year-old girl, who resides at 11 Staniford Street, West End.

"Dr. Richardson removed the girl's lower teeth, the roots of which had grown into her chin and were choking her to death; cut the roots and replaced the teeth without disfigurement.

"The operation took place at the New England Baptist Hospital, with which, together with the Massachusetts General, Dr. Richardson is connected. It is the first operation of its kind performed in this hospital.

"Miss LaCorchia was taken to the hospital on Thursday last, having suffered from excruciating pains in her chin for some time. At the hospital Dr. Richardson found the roots of her lower teeth had grown down through her lower jaw towards her throat, and bade fair, in a short time, to cause the girl's death by blocking her throat.

"By one of the most delicate operations known to science, Dr. Richardson removed the teeth and then, carefully reaching the roots, severed them without any disfigurement or the slightest evidence of an operation.

"The girl is still confined to the hospital, the teeth having been replaced, but being still in a condition which prevents the mastication of solids."

THE BRODIE MEMORIAL.

An Appeal to Every Dentist in Canada.

At the last meeting of the Ontario Dental Society, held in Toronto in June, a committee was appointed to undertake the work of securing a memorial for the late Dr. Brodie. This committee was composed of Professor Montgomery, Dean Pakenham and Mr. R. A. Thomson, all of Toronto University, together with the following dentists: Drs. Irwin, Webster, Pearson, Wunder, Eaton, Seccombe, Mason, Clark, Fleming, Reade, and Dr. M. P. Corrigan, the convenor.

Dr. William Norman Brodie was, at the time of his death, one of the greatest authorities on the continent as an entomologist, and we herewith give a brief sketch of his life and work:

Born in Scotland about the year 1832, he came as a boy with his parents to Canada, and with them settled on a farm about 30 miles distant from Toronto, in York County. Grew up on the farm, taught school as a youth, later on came to Toronto, studied dentistry, and for forty years practised his profession here.

Early in life he evidenced a great interest in natural history, and so diligently did he labor in his spare moments that he became, as some one has so aptly stated, "a specialist in every department of natural history." He became above all a great entomologist, and paid particular attention to the study of those pathological structures, known as galls, and also to the parasites of the insects forming these galls.

Dr. Brodie's collection of galls numbered 18,000 specimens, and a few years before his death the collection was purchased by the Smithsonian Institute, and to-day may be seen at the United States National Museum at Washington. It is said to be the finest on the continent.

Something of the magnitude of his labors may be gained from the statement that his complete collection consisted of over 100,000 specimens, representing the whole flora and fauna of Ontario, with the exception of the fishes and mammals. These were all carefully labelled, mounted and classified.

Shortly after the purchase made by the United States, the Ontario Government purchased his remaining collection of 92,500 specimens, and to-day it may be seen in the New Museum at Toronto University. Although probably worth about \$8,000 in money, Dr. Brodie turned it over to the Province for the modest sum of \$1,000, because he was desirous that the research work of a life-time should find a suitable repository, in order that others could carry on the work that he had started. At the same time he was appointed Provincial Entomologist at the University, and from his appointment in 1903 until his death in 1909 he worked unsparingly at his post.

Now the Brodie Memorial Committee met at the Dental College on September 1 and decided to have a life-size portrait of Dr. Brodie painted and suitably framed and hung in the college. The work is to be executed by Mr. Owen Staples, a leading Toronto artist and a friend of the late Dr. Brodie. The total cost will be about \$180. No one is to contribute more than \$2 to the fund, and smaller sums will be gratefully received.

It is the intention of the committee to make the memorial a national one, and an appeal is made to every dentist in Canada to contribute his mite to honor one of the great men of our profession.

Dr. Brodie sacrificed his desire for wealth and position, in order that he might accomplish his great work. He contributed his life for the advancement of science and the welfare of country. Let us not lose this opportunity to honor him, and in so doing honor our profession.

All subscriptions are to be sent to Dr. Horace E. Eaton, 631 Sherbourne St., Toronto, and these will be acknowledged in each of our three dental journals. Let every man contribute. Do it *Now*.

DR. M. P. CORRIGAN, Strathroy,
Sec'y Brodie Memorial Fund.

DR. HORACE E. EATON,
631 Sherbourne St., Toronto,
Treasurer.

FOR SALE—The dental practice and well equipped office of the late Dr. Robert Meek, Orangeville, a thriving town. A splendid opportunity. Full particulars from the executors, Toronto General Trust's Corporation, Toronto.

Reviews

NOTES ON DENTAL ANATOMY— (A Pocket Tomes) by T. W. Widdowson, Licentiate in Dental Surgery at the Royal College of Surgeons of England, Late House Surgeon to the Liverpool Dental Hospital. Author of "The Care and Regulation of Children's Teeth." London, John Bale, Sons & Danielsson, Ltd., Oxford House, 83-91 Great Titchfield Street, Oxford Street W., 1911.

The work contains, within its 125 pages, a mass of valuable and interesting information, arranged in systematic and concise form, that could not be gathered together independently without many hours of reading through the best literature on the subject. Here we find the various theories of the different authorities on the structure of the dental tissues, their development, calcification, etc. The development of the jaws and teeth, their eruption and absorption.

A short chapter is devoted to the surface anatomy of the teeth, and the remaining half of the work contains a brief, though complete, review of the subject of Comparative Dental Anatomy.

The volume will be found of interest and value to the practitioner, and can also be highly recommended as a supplementary text to the student, the alternating blank pages making it a desirable note book on the subject.

ESSENTIALS OF OPERATIVE DENTISTRY with illustration by W. Clyde Davis, B.S., M.D., D.D.S., Dean and Professor of Operative Dentistry and Technic, Lincoln Dental College, Associated with the University of Nebraska, Lincoln, Neb. Published by the author, 1911.

The text book commission of the National Pedagogic Association has for years been trying to have prepared dental text books which would be suitable to use as a guide in teaching the various branches in a Dental College course. Most authors and publishers have tried to make a book suitable for both practitioner and student. These have been failures as text books. But

have met fair success as guides in practice. The original books for dentists aimed to cover the whole subject of dentistry from the collateral sciences to the technical procedures. Such books became so large and voluminous that they were of little value to the student who was beginning the study of the subject. This book we are pleased to say is one of many which are now in the course of preparation. Every teacher of Operative Dentistry will look upon this book as a decided step in advance of anything yet published upon this subject. It has been prepared and published by Dr. W. Clyde Davis, Dean of the Lincoln Dental College, Nebraska. Dr. Davis has been for many years a prominent member of the Institute of Dental Pedagogics, and a teacher of long experience.

The arrangement and precedence of the work is good. On the whole the purpose of the book has been well kept in mind. In no case is there any padding. The essentials of the subject have always been before the author. It is a question if it might not have been better to have excluded extracting and taken the space for a fuller discussion of the management of dental pulps and pulp canals.

There are a few doubtful expressions used and an occasional doubtful procedure taught,—e.g., page 127 "rubber" is used interchangeable with gutta percha. "Fistula" is used when "Sensus" is intended. "Bathe the teeth with water to free them of bacteria and gummy substances." A water bath will not always remove bacteria or even gummy substances from the teeth. "Hermetically seal with gutta percha." This is impossible. Look up experiences of Head, Cook, Webster and others. The author suggests rolling tin and gold foil together to make a tin and gold filling. He advises rolling the cohesive gold on the outside of the tin. This is a mistake; the tin should be on the outside because it is non-cohesive and more adaptable than the gold. Tin and gold combinations are used in large, deep cavities of molars and bicuspids

Dominion Dental Journal

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TORONTO, NOVEMBER 15, 1911.

No. 11

Original Communications

SOME OF THE BUSINESS PROBLEMS OF THE DENTAL PROFESSION.

— — —
F. C. BRUSH, D.D.S., NEW YORK.
— — —

An address delivered before the Toronto Dental Society, October 24th, 1911.

Dentistry as defined by the standard of exchange of values, is a business. I have been criticized for calling dentistry a business, but according to the best authorities it is so defined. It is an exchange of values. The dentist gives service and receives money in exchange. Dentistry is neither trade nor commerce, because in these there is an exchange of commodities and not an exchange of services as in the former.

The purpose of all business is profit. If the exchange does not produce a profit or an increase the business is a failure. The business man must know the cost of production and the cost of distribution before he can figure on profits for the business.

By overhead charge is meant the rent, the heating, lighting, telephone service, insurance and incidentals of that kind. Those are all fixed charges. Then the cost of distribution would cover the cost of materials involved, dental depot bills, salaries for your assistants and employes and your own salary, and other little incidentals.

For the man in dental practice who wants to determine the cost of his service, first he must make an estimate of the expenses for the year. The equipment cost and a percentage for wear and tear on his outfit and his detailed expenses. You can arrive at practically what your year's expenses will be. Then to that add your salaries—the salary of your assistant and your own salary. That is a point that seems to stick in the crops of some of the men, why under the sun I advocate a man paying himself a salary when he owns the business and it all goes into his pocket. The money that comes into your office in the course of the day or month represents receipts of the business. How long do you sup-

pose a man running one of these stores out here could stay in business if he took the receipts of the day from his sales and put them in his pocket and then went to the races. Why, yes, sure, I have the money in my pocket. I can spend it. How long would he last? Isn't that pretty much what dentists have been doing—putting the receipts of the day into their pockets, and if somebody had paid their bill that day and they had \$12 in their pocket they dined and lived accordingly, and if they didn't get it they din't, and at the end of the month sometimes they are a little bit shy. That is poor business.

The laborer is worthy of his hire, or should be. You pay your assistant a salary. How long could the business conduct itself without your assistance? Not at all. One of the first things you should fix in your mind is this, that you and the business are separate and distinct. That is the first fundamental idea to get into your heads, that you are not the business and the business is not you. You own the business and work for it. The business must earn you or pay you a suitable living salary for the service which you render to the business, and it should earn over and above that a profit. That profit belongs to you at the end of the year or whenever you choose to take it. But unless that business is so planned and so arranged that it earns enough to pay you each week a salary which you need to live on and which you are entitled to, and something besides, it is not a successful business. I don't say you all have to take the same salary. I don't think you are all entitled to it.

Member.—How would you arrive at the salary?

Dr. Brush.—A man's salary is usually apportioned according to his productive power. If you can produce \$5,000 worth of business in your office you are only entitled to a salary in proportion. If another man can produce \$10,000 in his practice he is entitled to draw a salary in proportion. The amount of the salary I think each man must determine for himself. In the first place you can go back to the fundamental determining cost. You know what it costs you to live—that you have got to get or go under—and I think the professional man is entitled to a little bit more of a salary and to draw a little larger sum weekly from his business than though he were a clerk or untrained man.

The great advantage of paying yourself a salary is this: At the end of the week when you pay your assistant pay yourself, whether it be \$25 or \$100; draw it out of the business, and if it is not there you will begin to wonder why. And I know from what men have told me who have started it that the fact that when sometimes along in the middle of the month when the bank account was low and there wasn't quite enough there to pay the week's salary they thought they ought to have, they began to wonder why, and that one thing has done more to get those men started on looking after their collections, rendering their bills and getting their money in than any other one thing I know of. That is one reason why you

should pay yourself a salary. It will make you think of the business side of your practice, instead of saying, "It isn't here this week, I don't need to pay the grocer's bill," or something of that kind. Draw the salary out of the business and see the business produces it and that it is there every week and a little more besides, because it is the little more that represents profit. Your salary doesn't represent profit.

Professional men, as a rule, are considered pretty poor business men; we live from hand to mouth. As I said before, the man who at any time has his collections come in well and the bank account is fattened up a little bit, gets visions of automobiles and opera tickets and things of that kind. That may go on for several years, but if seven or eight months afterwards collections are not so good, he is beginning to scratch a little bit to see where the rent is coming from. If you put yourself on salary and limit yourself to that salary, you will very soon take stock of your business and you will plan to live within that salary and save a little from it, just the same as though you were working for somebody else. Put away a little of that salary for a rainy day.

A Member.—Do you think the salary that should be paid should be only what a man should get to live on?

Dr. Brush.—A little more. What you need to live on, pay your life insurance and a little pleasure and a little spare money in the bank for a rainy day, just the same as though you went out and worked for somebody else, you would expect your salary, and expect it at the end of the week. Consider the business as your employer and you will soon find you will be able to regulate your business expenses. And for the married man I would say put your wife on an allowance, give her to understand she can have a definite amount either to run the house on or for her own personal expenditures or both; that amount she will get every Saturday night and it is hers, and what she can save belongs to her, and she will regulate your house and keep within the lines and you will be surprised how soon it will straighten things out for you and relieve some of the care. In speaking with young men I very often ask the question, "How much did you make last year?" A man will say, "Well, I made \$4,500." Does that \$4,500 represent the gross receipts or the gross amount of business that you charged on your books, or does it represent the amount of cash you received during the course of the year, or does it represent the salary which you drew out of the business, or does it represent the profit over and above all expense and salaries? By that time he is usually up in the air and is pretty apt to inform me that that \$4,500 represents the gross amount of business which he thinks he is doing; and in the States any man who is doing \$4,500 of business, if he is collecting that amount a year, in round numbers, he can't possibly net out of that \$4,500 more than \$1,500, and that \$1,500 has got to represent his salary or whatever he has a mind to call it.

A Member.—That is to say, it costs \$3,000 to earn \$1,500.

Dr. Brush.—That is according to the way most men conduct their practice. I find lots of men doing a practice of \$4,500 or \$5,000 and they are living the same as men engaged in commercial life who are receiving a salary of \$5,000. They are living on that same scale and mixing in that same social circle.

A Member.—Is that the fault of the business or the fault of the man?

Dr. Brush.—Both. The man principally, because he didn't get down to brass tacks and figure out where he stood. He says, "I am taking that amount in," and he lives accordingly, but that doesn't represent income or salary to him. Out of that has got to come all the expenses of the business, and when he gets down to the net it is pretty small.

Now, a man who has been engaged in a profession that takes as much out of him in the way of energy as ours does, a man who has been in practice eight or ten years and works a normal number of hours, if he can't earn \$5,000 net for himself, I don't think he is much of a success. I dare say that any one of you in the room that would go out and take a position that calls for the same expenditure of preliminary training and brains and vital energy you put forth in your practice would easily earn a salary of \$5,000 and that salary would be net. But when you do a practice of \$5,000 you haven't got a \$5,000 income. Your income at the best doesn't exceed \$2,500. Here and there a man may be able by careful business management and close economy to cut his expenses down somewhat, but roughly speaking it costs 50 per cent. of your gross income to do business. So that is one reason why I advocate living on a salary and putting that in your yearly statement of expenses. Figure out what you think you are worth to the business, to the public, and charge that salary and put it into your total of expenses.

You can't properly make a fee which is to represent the exchangeable value in return for your services and make it along the lines of successful business unless you know what the cost of the service is. Men say, how can you determine the cost of such an intangible thing as professional services? Well, it is hard unless you look at it from a broad standpoint. In the first place you have got to determine what it costs you in the way of an investment to procure your education to fit you to render that service. You find that you must maintain an office suitable for the class of patients which you are catering for. Those are all added in, so that you find from this schedule of yearly expenses that it costs \$5,000 a year to conduct your practice. Allow yourself a salary of \$1,500, and say it costs in round numbers \$5,000 that you have got to receive—not only earn it, but you have got to receive it in order to pay all your bills promptly. Now, then, you figure out from the number of normal working days, cutting out Sundays. The reason why dentists have been practising on Sunday was for fear of losing a patient. There is no other excuse for it. Cut out

those days, and a sufficient number of days for vacation, and divide the total number of days by the number of days you decide are a normal working year for you. That gives you the expense per day, and divide that by the number of hours. I don't think we should plan to be in our office over eight hours, and cut that down as much as we can. Now by doing that you can reduce it down to the point where you know that it costs so much an hour to run your office. Now, when you come to perform an operation, if it takes you an hour and if you find it has cost you \$3 an hour to meet all expenses and pay yourself a suitable salary and a little more for profit, you can't afford to do the operation for \$1.50 or \$2. A dollar for an amalgam filling is considered pretty good, outside of the larger cities. It costs you more than that to render the service. How can you as business men with families to support and with social position in the community to maintain afford to do business at a loss? Fixed charges determine the minimum amount of the fee in your office and my office. Those fixed charges determine the minimum amount of the fee you can charge and do business at a profit.

The maximum fee is to be represented and is governed by the laws of supply and demand, just as it is in any other trade. If you through your skill and ability or personality can attract enough people to you so that your hours are engaged and there is a demand all through the normal working hours which you have set aside for your profession, those hours are all filled and engaged by patients, and still there is a demand for your time, then the law of supply and demand comes into play and you are justified in raising your fees. That is the time to raise the fee to the individual. If you have been working on an average of \$3 an hour, get \$4 and get \$5. You say, "I will lose my patients." Of course you will. That is what you want to do. You want to lose patients. That is not orthodox teaching to you, because the older men down in the part where I come from have always said, "The way I attained my success was when patients came I kept every patient I had; do everything, sacrifice everything, but hold your patients." They succeeded that way; nothing ever got away from them. If the patient that came to them wouldn't pay \$5 they took \$2 or \$1, but it never got away from them. That, gentlemen, I say is not ethical. It is not ethical, because they come before you and preach friendship, fraternity, brotherly love and good-will and wish you success and seek to get and keep everything that comes their way. Now, I say it is better for you to lose your patients and let the other fellow get some. That is more ethical. Let the younger men come along and have a chance. When your practice is full, when your working hours are full and there is a demand for your time, the overflow should go to the other people. The usual way of increasing the income in dentistry is by increasing the working hours or by cutting corners on the operations. A young man builds up a reputation for doing good work. He

has plenty of time, he takes time to perform his operation, and then he gets crowded a bit and he forgets something; it is not quite as good, he was hurried that day, and later on he gets into that slack habit, and some day the time may come when his best patients are drifting away to a younger man who still has time to attend to the patient. He is losing them. He might better take the time to perform those operations to the very best of his ability and then charge what the service is worth. If that method of operating has produced a demand for his services then he is entitled as that demand increases and continues to increase his fees and thereby weed out some of his patients. You may lose by such a method. When I put it into execution I think I lost in the first year about 30 per cent. of my patients. I got cold feet, the same as any of you would. I was experimenting. I had to learn this thing to see how it worked out, but I found by keeping close watch of my books that at the end of the year, although I hadn't worked quite as hard, and instead of working overtime I had limited my working hours to a normal day, and while I found I had lost about 30 per cent. of my practice, my income for that year had increased over a thousand dollars. Supposing your fee is \$5 an hour and you need to earn \$25 a day, I think it is easier and better and the patient gets better value if you see five patients, working five hours, than if you try to see ten or twelve. Five patients at \$5 an hour produces \$25. If you take ten patients or twelve patients and crowd those into the time, you know just as well as I do you can't give the same service, you are losing time. Every time a man says to me, "I am so busy I don't know which way to turn," I say, "How many patients did you see to-day, and I can tell you how much you earned?" knowing something of the man. He says, "What do you mean?" I say, "You didn't earn as much as you did yesterday when you saw five." He says, "Why, I was rushed with the number of people I saw." Yes, but he necessarily lost part of the day; he lost time every time he changed a patient. If he changes his patient five times he loses 50 minutes. That is nearly an hour out of his day.

A Member.—But he had two chairs and he went from one to the other.

Dr. Brush.—Maybe. I think two chairs is a snare and a delusion. Until we find a way to grow an extra pair of hands, an extra pair of legs and a body and brain to go with them I don't see how one man can run two chairs at the same time. It is all right to say you have your business so systematized that the assistant gets the patient all ready and seated in the next chair and you step from one and go right on with the other. I don't know how long you will be able to keep that up. I know I couldn't keep it up very long and do good work, and I don't think the patient feels as satisfied as when he gets individual attention.

I work on the hour basis absolutely. Another fundamental point I want to impress upon you is, gentlemen, don't sell fillings,

don't sell crowns and don't sell dentures. That has been the bane of dentistry from the time it started. You have been selling materials, you have been nothing more or less than merchants and patting yourselves on the back and calling yourselves professional men. An amalgam filling costs so much, gold costs a little more, according to the size. Perfect rot! Don't sell fillings, but render services as professional men. Sometimes a new patient may say, "Doctor, I would like a gold filling in this tooth." "Why do you say you want a gold filling? Who told you?" "Why, I want my tooth filled, I want a gold filling. I usually try to be a little tactful and sometimes give a hard shot. I say, 'Excuse me, that we may not misunderstand each other, I consider you came to me for what? To buy a filling? No, I am not a merchant, I am not a jeweller, I am not selling ornaments, I am a professional man rendering service. From my point of view you came to me seeking relief from pain, possibly, but you wanted your mouth restored to health, and you wanted lost tissue restored, and you wanted the pain relieved, and you wanted comfort and appearance. Now, what difference does it make to you what I do or what materials I use in accomplishing that result? If I do the work I am not going to charge you for the material I use, but I am going to charge you for the result, which, I think, is what you came for. Is that so?" "Why, yes, of course." They see the logic of that argument. I say, then we will not discuss my remedies"; and I always refer to gold and porcelain merely as remedies; that is all they are to the patient. You remedy the disease or the mutilated condition. What difference does it make to them or anybody else whether it is gold or silver; you are the doctor; they want you to use your judgment to do the proper thing at the right time and to produce the result. We are professional men rendering service.

Some of the men in dentistry and in the other professions have just heard enough of commercial terms to have gotten frightened at that bugbear, competition, and look upon their neighbors as their competitor. I don't believe that there is any competition between individuals in the true professional sense. I think that the man's only competitor is himself—competing with yourself continually to try to make your hands do in competition with your brain the things they should do. Compete with your own skill, with your own knowledge, with your own business ability, with your surroundings continually. You are not in competition with the practitioner next door, and if you only got those ideas settled in your mind it would be lots easier. Men get that notion of competition in their heads and they go down street and they find some little store has perhaps been driven out of business and the business has dropped off because Knox has come along and started a fifteen-cent store, and you see a lot of people flocking in there, and you say, "They are doing a big business: look at the competition. What can you do against that cheap price?" So you

are frightened by competition. Some other man comes into your neighborhood, and at first you are afraid he is going to do things a little less than you are, so to get there first you grab the patient and cut down your own fees, so you compete against yourself. I find in talking with most dentists that their whole thought of competition is competing downward; they never heard of competition upwards. That is the only competition you want to consider with the man next door. If a new man comes into your neighborhood and you find out his fee is \$4 an hour make yours \$5 and what will happen? The \$4 people will go to him, but the \$5 people will not; they will come to you.

A Member.—Still, there must be a great many dentists who cater to the poorer classes.

Dr. Brush.—Well and good, there should be, and there is the place for them and we should let them have them. If they can't afford a five-dollar man you ought to let the ones that can only pay a dollar go to those fellows, and those fellows ordinarily would be what?—the younger men, the young graduates.

A Member.—What do you do when a patient comes in and asks terms? Do you say you charge so much an hour?

Dr. Brush.—When they ask me what my fees are. The hour fee can be applied to every operation that I know of connected with the general practice of dentistry with a possible exception, and that is the extraction of teeth, which should not be done for 25 cents.

That is what you give the porter on the train for a tip. Professional men three or four years in practice taking tip money! The people in your neighborhood, your clientele sometimes or their friends suddenly find they have got a little felon started on their finger. They wrap it up in a rag and go down to the doctor and he has to lance it, and his fee is from \$2 to \$5 for letting out a little pus. A patient comes into your office in great pain and needs immediate attention; you open the tooth and let out a little pus and what do you get for it? As one man said to me, "I am tuckered out, I worked all day long like a horse, and I haven't got a dollar on the books to show for it." I said, "For heaven's sake, what have you been doing?" "Oh, it is just this time of the year when things come; I have been treating teeth all day long." "Didn't you charge for it?" "Oh, yes, I'll get paid for it, of course, when I put in a filling; it will be included in the filling." Did he keep count of the time he spent in treating those teeth? No. For the amalgam filling ordinarily \$1, if treated a dollar or two extra. Those kind of fellows treating that way usually treat them for a week or ten days before they put the filling in. But, to go back to the extracting of teeth again—a surgical operation, the removal of an organ which may involve possible infection, may involve possibly a suit for malpractice, will take from 15 minutes to half an hour of your time from the time the patient gets into the chair and the chair is again ready

for the next patient, although it may not take you over two seconds to extract the tooth, but it has taken out of your ordinary time probably half an hour, and you maintain an establishment and perform the surgical operation with all these possibilities for what? Fifty cents! The price of a hair cut, what you throw down on the counter for two or three cigars. Is that a professional fee? Is it any wonder that the medical men have scorned the dental profession in the past? Is it any wonder that the people won't pay any more? Why should they, they have never been asked any more. The barber did it first or the blacksmith knocked it out with the tongs and lots of them felt far more satisfied after he got through when they were laid up for a week, and they thought it was far more of an operation and worth a great deal more than when we do it painlessly. A man says, why, I am going to have a plate made and you must not charge anything for the surgical operation. But, you charge for a mere mechanical thing that an untrained hand can do almost as well as a skilled one. I mean a laboratory man without college training. I don't think we ought to put ourselves on that basis at all.

A Member.—In marking on your book would each day work out the same at the end of the day?

Dr. Brush.—If you did the same amount of work you would want the same amount each day.

A Member.—In regard to abutments for bridges or any other preparatory work would you put that time down at \$5 an hour?

Dr. Brush.—Absolutely. I consider that is just as much part of the service. I consider the preparation of the abutment far more of a surgical operation than the mere mechanical matter of making a shell crown or bridge and cementing that in.

A Member.—Supposing you only spent an hour on an abutment and you haven't completed your crown or bridge would you put down that as \$5 then or wait until you put the crown on?

Dr. Brush.—Make the charge right at the time. I may be dead to-morrow and who is going to collect? The man who carries his business in his head will never get ahead of his business. Fix that in your mind.

A Member.—When you come to put in the bridge, supposing you charge him \$5 for the hour that you take, the gold in the bridge is worth six or seven or ten dollars, you lose \$5.

Dr. Brush.—No, I do not. That is an additional charge. That is a laboratory charge.

A Member.—Do you charge for the material?

Dr. Brush.—No, that is the laboratory charge.

A Member.—You have already charged for your work.

Dr. Brush.—Take for instance the preparation of a crown. It is necessary to restore a tooth by means of a gold crown. The tooth has been devitalized and properly treated and all we have to do is to prepare the root properly to receive the shell. That preparation and the impression for making the crown in the labora-

tory consumes half an hour and we are working on the \$5 a hour basis. There is a charge of \$2.50. That goes into the laboratory, and laboratory time is not worth as much as operating time by any manner of means, even though you do it yourself. That I maintain in a spirit of fairness and if you see fit to spend your time in the laboratory doing laboratory work you are not justified in charging as much for that as you are for the service you render as an operator at the chair over the patient. The only fair estimate to put on the matter of the mechanical construction of the crown is what it would cost you to have it done in a laboratory. If you can get the crown returned to you for \$2 that governs the price which you are justified in charging to your patient, but to that as a laboratory charge you are also justified in adding a certain amount for profit. You can make that profit 50 or 100 per cent as you see fit. You are not called upon to turn that over to the patient at cost price. Any man in business expects to make a fair profit on whatever he is exchanging. So you would say that the cost of a crown, the laboratory charge would be \$2 and plus 50 per cent. profit would be \$3 and you charge that against the patient. Now you have got \$5.50. When you come to set that crown it takes you another half hour, there is another \$2.50. The total of those three items gives you the amount of the fee which you are entitled to receive from the patient. But, I have had men come back and say, I can get \$10 for a crown. Yes, you sell crowns for \$10. In that case you got perhaps a little more, but supposing the case that came in was one where it was a putrescent pulp or an abscess and it was difficult to get that root into condition and you had to reduce that abscess and relieve it and cure it and you spent several hours in doing so, do you make anything in putting a crown on at \$10? No, you lose. Nor is it fair to the patient or fair to you to charge the same. I maintain that the patient who visits the dentist with proper regularity, who exercises ordinary hygienic care of themselves, who aim to keep their mouths in good condition are entitled to receive the benefit of that, and if owing to the care which they have taken of themselves you can perform an operation for them, be it crown or filling or whatever it is, in half the time that you can for another man who simply lets everything go and comes in with a mouth all filthy and cavities which have become extensive and pulps exposed and all that, it is not fair to charge those people the same fees. It is not fair to the man who is taking care of himself, and it does not put any premium on individual care of the mouth by the other man. If he neglects his mouth and lets it get in that condition he ought to pay for it. On the hour basis you get paid for what you do and the patient gets what he pays for.

I don't think any of us really ever get properly reimbursed for the time we spend on dentures, not at the prices that these men get around the country. We have been basing the price of dentures and bridges upon the cost of material without knowing anything about the cost of production. We have simply figured that

the teeth and materials cost so much and whatever we get over and above that has represented a profit. That is not so. You arrive at the cost of making a denture by keeping account of the time which you spend in preparing the mouth, other than extracting, making your impressions, getting the bite, trying in the teeth, the individual carving of the teeth that is done in the mouth to meet certain esthetic features, and all the time that is spent over the patient in the chair we charge as operating time and then to that add the cost of labor.

Sometimes a patient will say to me, what do you charge for a denture? And I say, to illustrate, for a vulcanite finish anywhere from twenty-five to seventy-five dollars. Well, what is the difference? No difference in the material, it is only the difference in the time that I spend upon it in giving that denture individuality and making it look suitable and fit for you. If you want and can only afford one at \$25 then I will do the best I can for you, but if you want something that looks as though it were intended for you and looks as though it belonged to you and is going to require a lot of time on my part to carve those teeth and adjust them and fuss over you getting them fixed to meet with your approval and with my approval, and to give them those nice little touches that give it individuality, then you have got to pay for it. Well, they may hesitate a bit, and she may say she couldn't see the difference. A little illustration that goes sometimes with the ladies is the dress-maker. I say, it is like everything else, it is like your dressmaker. A dress is a dress, what is the difference? You know a dress is a dress; it doesn't make any difference whether one of the old maids around the corner makes it for you or whether you go to a Fifth Avenue tailor? What is the difference? All the difference in the world in fit and workmanship. Oh, there is a difference? The material is the same, isn't it? Well, that is just the case with your denture, the material would be exactly the same, and it is for the skill and ability and workmanship and fit and style and appearance, all those things you admire. Then they see the point.

A Member.—Some days you will feel like it and you will give your patient twice as much work in the time that you will on another day when you don't feel like it. Do you make any allowance?

Dr. Brush.—When you are in your normal condition and it takes sixty minutes you charge the sixty minutes, but if I were to appear in my office to-morrow morning after being here with you to-night, probably tired and mentally exhausted, I would not be up to my standard and it would not be fair for me to work sixty minutes and charge the patient my full hourly fee. While I advocate getting all that is due you I advocate it in a spirit of fairness, to yourself and your patient.

A Member.—Supposing a patient comes back in six months and you feel conscientious about it and you feel you didn't do as good

work as you might have, would you feel you should replace that work or would you adjust that?

Dr. Brush.—If you will get yourself into the habit—into the physical condition and into the habit of limiting your hours to five or six working hours in a day, meeting three to five and possibly six patients, instead of seven or eight hours of office work day after day, taking sufficient time with each and every operation to do it properly, you won't have to think of those things six months from now, and that condition that you name does not arise.

When you get to conducting your business on a business basis and realizing every moment of your time represents to you a definite expense you will be watching your operating pretty carefully to see you are not losing money by doing work over which has been improperly done.

There are men in the profession to-day, men as old as Dr. Wilcott, who are not getting any more to-day per filling than the day they started in practice. That is wrong, absolutely wrong. If a man is not worth any more it is too bad, but if he has been attending his dental society meetings; if he has been reading the dental journals; if he has kept his office up to a standard of neatness required by modern conditions; if he has improved and kept up-to-date in his equipment in the physical things in his office; if he has kept up-to-date mentally, he is worth more money. His services are worth more to the patient. If I felt that I couldn't get more year after year per hour for my services by attending dental society meetings, by keeping in touch with you and the other men in the profession to get your best thoughts to take them back and give them to my patients then what under the sun's sense would there be in taking time which I would like to have for pleasure to read a lot of dead rot and chasing around to dental societies? It doesn't mean the snap of of the finger to me except as I can carry it back and deliver it to my patients and capitalize it for myself. That is why I say the older man in practice is entitled to a better fee than the young man in practice. The younger man coming out of college is the man that should get those \$1 patients. If you didn't have the feeling that you could get a better income for yourself and to provide for your family five years from now than what you can get now then what, under the sun, incentive would there be for you to stay in the profession?

The question of estimates is one that comes up very often. I will give you my idea of it. A man says to me, would you give an estimate to a patient? Certainly. It is not fair to a patient to have them come into my office and allow me to go on and perform operations that I consider necessary to put their mouth in the condition I think it should be in and run up a bill against them and they know nothing about that until they get through. In the first place it might be unfair to them because they might not be able to afford my fees. It would be unfair to me to find that they couldn't pay for my services when I got through. I think it is

much better all round to have an understanding. I charge for consultation as well as for examination. It took me three years in college and twenty years in practice to learn what little I know now to be able to give the patient the advice that I am able to give now and it cost me a lot of money. It is worth something. If it isn't any good, go out of business.

A Member.—In giving that advice would you adjust your fee to the time you spent or the value of the advice?

Dr. Brush.—The time that is spent, provided they occupied my time in asking questions, as some of them do.

A Member.—Don't you think you should be a little bit of philanthropist? We will suppose there comes in our office during the day two different people, they are equally worthy but not equally fortunate financially. Perhaps one person is poor, but is thought much more of in the neighborhood, and really more worthy, and perhaps he has the same operation to perform but cannot afford to pay what another person who is more fortunate can. They both take up an equal amount of your time. I think that poor patient is entitled to just as much good service, and it is a matter of conscience with me whether I should say to that person, no, you must go to so and so, or you can go to somebody whose time is not worth as much as mine. Perhaps \$10 for the rich person is not as large a fee as \$3 for the poor person.

Dr. Brush.—Is that any of your business? I am not saying that in a personal way at all.

A Member.—I think it is my business.

Dr. Brush.—You can't ask the same fee from everybody. I don't think you should nail it onto one fellow.

A Member.—Would you let the poor man die simply because he has no money in his pocket?

Dr. Brush.—No, neither would you. One is an absolute necessity. Would you turn a man down in your office if he was suffering from pain? I wouldn't if he didn't have a cent.

A Member.—Is it not necessary he should have dentistry?

Dr. Brush.—Then he should go where charity is given. A patient who can only afford an amalgam restoration for a tooth has no business to come and ask me to put in gold.

A Member.—Supposing he can't afford amalgam?

Dr. Brush.—Then he should go to the charity clinic. But the point I want to make is this. Charity hasn't anything to do with business principles. We are not considering the charity end of it. Charity is not a business proposition. It is philanthropy.

A Member.—You have a multi-millionaire, he doesn't appreciate your \$5 an hour and you have got to charge him \$10 or \$20 an hour.

Dr. Brush.—What I have been trying to bring out is the method of determining the minimum fee which you can charge and do business at a neat cost or at a little profit, and as I said before maximum fees are only limited by the law of supply and demand.

A Member.—Supposing a patient said, I will pay you the \$150 when the work is done.

Dr. Brush.—Then I would likely ask for financial references.

A Member.—Supposing it is not a stranger, but one of your former patients.

Dr. Brush.—I tell them frankly, and if they question and say, why, doctor, I have been coming to you a long while, you never did that before. I say, I understand that, but you know business is business and cash business is proper business; and I would say to a patient, I have been working for you for some time and apparently it is not a question of ability on your part, it has been a question of negligence. I have rendered bills to you and you have allowed them to stand three and four and five months. I need that money. I am doing business on a close margin. I have to live and I have to pay my bills in order to keep my credit good, and I can't afford to work for you at those fees if you are going to keep me waiting six months for the money. It is just as easy for you to pay the bill to-day as six months from to-day, and it is far more convenient for me to have the money.

A Member.—What do you do with a patient that you know is going to pay you, that you have rendered your bill to three or four times?

Dr. Brush.—When you buy supplies at the dental depot what do you get with them? A statement. You don't feel insulted, you don't feel your credit is being questioned. No, that gives you a check on what you have had. I feel that people have just as much right to know and have a check on what they have had in dental services as they have in commercial life, only as a rule work is running over several days and it is not necessary to render a statement with every operation, because it is in their minds. I don't think my patients forget so soon at the end of the day that they have been an hour in my chair, and so I don't have to render a statement every day, but at the end of the month the statement goes, finished or unfinished.

Now on the question of rendering bills for work that is finished for people whom we trust: Finished between the first and 15th a bill goes out on the 15th; work finished between the 15th and 30th, a bill goes out on the 30th. If the bill which was rendered on the 15th has not been paid a second one goes on the 30th. If it goes over with the same individual, in 15 days they get another bill.

A Member.—What do you do with patients who come in to get an estimate and take up your time and say they can't afford to have it done just now, and get away?

Dr. Brush.—They don't get out of the office without passing me first. If they are people I don't want to keep as patients I probably let them go. If they are shoppers that have come for a little advice, got kind of curious in the night and just wanted to know about it the next day, if they take up ten minutes of my time it is \$2.

Now with reference to the proper conduct of a practice, we are speaking now of a practice after a man has been in it for a sufficient number of years so that his time is well occupied. I have been doing this thing so long, I have been working long enough so that I know about how long a certain operation is going to take, so that I know in making an appointment how much time to allow. My appointments average an hour, seldom exceed one and one-half hours unless some unusual condition arises.

THE FEATURE OF COMPENSATION.

MALCOLM W. SPARROW, L.D.S., D.D.S., TORONTO.

Those who heard Dr. Brush, of New York, when he addressed the Toronto Dental Society on "The Business Side of Dentistry," had much to consider. If there were those who were not chagrined at some of their own follies, then certain facial expressions were deceptive. If there were those who did not receive inspiration and assurance, it was because of old-time prejudices, and short-sighted conservatism. If there were those who did not wake up to the actual and unsentimental conditions of bread-winning, through the medium of dentistry, it was because they were in ruts so deep that they could not see the light—so hide-bound with the advocacy of dental ethics that they could not tolerate for an instant anything resembling an innovation. If there were those who were complacent and tolerant, slick and prosperous looking, it was because they were already successful, and enjoying the comforts, and some of the luxuries of life.

Fortunately there were many of the new graduates present, and it was evident that they wished to obtain a proper understanding of the matter before much time had been wasted in the struggle for a competency. The pity of it is that they did not learn it at college. A chair in college, teaching the business side of dentistry, would prevent many a failure, would tend to make our business methods uniform, and would indirectly educate the public to a higher appreciation of our services, with a better understanding of what they must pay for. It is only by working together that we will ever secure the proper compensation.

There is no getting away from the fact that we enter dentistry for a livelihood. All sentiment aside, this is the prompting of our decision. It is the impetus that drives us on to our matriculation; the inspiration that helps us through the grind of a severe and an expensive professional course; the magus that whispers "courage," as we struggle to establish a lucrative practice.

He who enters dentistry with such exalted ideas of ethics that the thought of pecuniary compensation is not to be considered, must

necessarily have an independent income with which to keep the wolf from the door, and such a man is often detrimental to those who depend entirely upon their profession for sustenance. I doubt if there was ever a man of this stamp who added one iota to the advance of our profession, or to the lasting welfare of his patients. The men who have done the most for dentistry have died in poverty. It is the most lamentable thing we have to remember, the most startling evidence of ethical short-sightedness and business incapacity.

Nevertheless, I am prone to admit an approval of professional ethics. I am an advocate of everything that will tend to elevate our standard and lend dignity to our profession, but if professional dignity serves me only half a loaf, when my earnest and conscientious efforts should provide a whole loaf, then lead me to the altar of the Golden Calf, that I may fall down and worship. Does this sound mercenary? Not if you understand me. I have no desire for riches, only a yearning for comfort. I believe in justice to my confreres, justice to my patients, justice to myself, and, above all, justice to those who are dependent upon me for sustenance and happiness. A sentimental negligence of the business side of dentistry will never enable me to do justice to anything.

We have a right to all of the necessities of life, and to some of the luxuries. We are expected to be respectable, and live as becomes the well-to-do, but if our bank accounts will not permit, we must necessarily sink into dispicable oblivion, and, slipshod wander through the streets. "Unto him that hath shall be given, and from him that hath shall be taken away." In the eyes of the public there is nothing so pitiable as the dignity of shabby gentility. We may never have the wealth of the business man, for we do not stand in the monetary stream, but we have education, and it is generally understood that intellectuality supersedes riches. But even intellectuality can have no great prestige without a monetary background.

A false idea of the situation, and a bad management of our affairs is sufficient to produce a condition that is anything but consoling. Dr. Brush has given us much to think about, and "Brother Bill" has propounded excellent advice. If we obstinately refuse to see the light, we deserve nothing but ridicule. At church we often hear the minister exclaim, "What are you doing for Eternity?" But I say unto you, just as religiously, "What are you doing for old age! Why conduct your practice so recklessly, so sentimentally, that when age creeps upon you, you must needs whimper your wants in the midst of poverty! Are we not public benefactors? And do we not deserve the compensation that will leave us comfortable in our superannuation? Get at the cold hard facts of the situation, and strive to master them."

Dr. Brush told us that the cost of production was the fundamental principle upon which to build an income. He pointed out the

This law, then, is, as I read it, that whatever arrangement of

teeth and plumpers will best serve to restore the mouth. the lips and the adjacent parts to their proper former will invariably be artistically correct—that is to say harmonious—when viewed merely as teeth.

The general arrangement which I have described as used in this necessity of computing our annual expenses, the necessity of giving ourselves a definite salary, the necessity of collecting our fees, the necessity of establishing a saving system that will enable us to meet our obligations as they come due. He did more than this: he advocated the charging of fees for everything that we do. at a certain rate per hour—this rate to cover expenses and salary—and that we should refuse “tips..” He enlarged upon the fact that a fee of twenty-five cents was a “nigger’s tip,” and it would be better to take nothing than a fee so menial. He belived in fees that were substantial and encouraging, and whenever a man figured out that he was not getting a sufficient recompence for his work, it was his duty to advance his fees. He declared that to “knock” the other man’s higher fees was an injury to one’s self. The other man is a pioneer, opening up the way to better compensation for every underpaid practitioner. When you hear of a man getting a good round fee for his work, rejoice, for it is your opportunity to step up beside him. Nor need you ever degrade yourself through advertising medium. If you do your very best for each patient, you need not worry about “who will be the next.” Your reputation will soon be established, and the prospect of a good income will shine brightly before you. “Step out from the surging crowd and make yourself a master.” Then, if you put common sense before sentiment, business before pleasure, economy before expenditure, the Lord will provide.

ACADEMY OF MEDICINE, TORONTO.**SYMPOSIUM OF DENTISTRY, OCTOBER 27, 1911.****WHAT MOUTH HYGIENE MEANS TO THE CHILD.**

W. H. DOHERTY, D.D.S., L.D.S., TORONTO, ONT.

Read before Section of State Medicine, October 27th, 1911.

The widespread interest in mouth hygiene that is just beginning to manifest itself in this country is but one aspect, though a somewhat belated one, of the rapidly increasing tendency towards the betterment of health conditions. This general interest in health problems has been very largely due to the discovery from time to time of the cause of disease, and with this knowledge has come also the modern tendency to fight disease from its prophylactic rather than from its therapeutic aspect.

Naturally perhaps the first problems dealt with have been those where it has been quite evident that the laxity of the individual or community, in observing sanitary laws, has been a menace to public health. We have reached a stage, however, where certain problems of personal hygiene can no longer be overlooked. While efforts have been concentrated on pure food, better housing, sanitation, the prevention of tuberculous, etc. There are conditions in the mouths of a large percentage of the public which to a great extent nullify the effects of these public health measures. I wish to point out this evening some conditions coming within the field of the dental surgeon which have never received the attention they demand and which bear such an intimate and momentous relationship to practically every present day health problem as to command the serious attention of everyone interested in good health and good citizenship.

A systematic study of mouth conditions among school children on this continent has revealed the alarming fact that only three or four per cent. have sound teeth and that dental caries and associated diseases of the mouth constitute an evil that is undermining the health of the nation. These statistics only bear out what has been found in Great Britain, Germany and other countries showing that dental disease is almost universal in its distribution among civilized peoples and constitutes a factor in ill-health and disease second to no other which affects the human race.

When I state that in two schools in this city about 95 per cent. of the children were found to have decayed teeth, the prevalence of the condition can be readily grasped. It is impossible for me, however, to give this body any adequate idea of the horrible conditions found in the mouths of a great many school children. They are conditions which have to be seen to be appreciated. Mouths

repulsive with filth and decay, hypertrophied and inflamed gum tissue, jagged and suppurating roots, cavities filled with "mouth garbage," teeth the root canals and pulp chambers of which contain the dea and putrefying remains of the artery vein, nerve and connective tissue which formed the pulp of the tooth; frequently as many as four or five alveolar abscesses veritable pus factories pouring continuous streams of pus into the mouth and stomach of the child; teeth covered with green stain and fermenting food particles, and in many cases as a direct result of this mass of infection a throat blocked with adenoids and enlarged tonsils and a tongue giving striking and abundant evidence of the resultant indigestion and constipation in the intestinal tract.

This is not an exaggerated picture. Anyone will recognize it who has had an opportunity of examining school children's mouths. Neither is it confined to the poorer schools. Oral sepsis is no respecter of persons. Thousands of cases of which the foregoing is a faithful picture may be found in the best city schools both here and elsewhere. I have seen conditions in the mouths of children that you would step around if you saw on the street; conditions as pitiful as they are horrible, accompanied as they are in almost every case by evidences in the physique and face of the child of malnutrition, septic poisoning and dangerously impaired vitality.

It is impossible for me within the limits of this short paper to refer in more than a very cursory manner to the general effects of such septic mouths. Few dental surgeons have been more than a short time in practice before they have had abundant evidence of the ill-effects arising from these conditions and also of the marked improvement when the conditions are corrected. Wm. Hunter has drawn the attention of the medical profession to some aspects of oral sepsis as a cause of diseases of the digestive organs, pernicious anemia, tonsilitic, pharyngeal and eustachian tube infection, etc. Other authorities have pointed out the relationship between septic mouths and cancer of the stomach, appendicitis, tuberculous, pneumonia, etc. To a very few of these I shall have occasion to refer briefly later.

A serious condition outside of the septic condition is the inability of the child to properly masticate. At no time in the life of the individual is nutrition of such paramount importance as in infancy and childhood. The young child is expected to double its weight and then do it all over again repeating this process till maturity. In addition to this great physical contract, it is expected to enter the kindergarten with a mind just beginning to sprout and in a comparatively few years to have grown mentally to a sufficient extent to enter the university; and on top of all this to have developed the moral fibre necessary to uprightness and good citizenship. To accomplish this physical, mental and moral growth the child needs every ounce of nutrition it can obtain. That it may obtain this nutrition nature has provided a set of twenty temporary teeth to be used from the time the child is six months old when

they begin to arrive until they are all replaced by the larger permanent teeth at about twelve years of age. Up till six years of age the child is entirely dependent upon this temporary set for mastication. At six years nature provides four large molars, the "six year molars," which come one on each side above and below just back of the temporary teeth as an aid to the child in mastication while the first set is gradually being replaced. How many parents know these few simple facts that mean more to the child than any other thing? Most parents recognize the period of "teething" as the first great period of stress through which the child passes. How many realize that the second great period of stress and one much more disastrous in its results than the first is the period during which the first teeth are being replaced by the second set? Evidently very few, if one is to judge from the appalling neglect of the temporary teeth and the almost universal failure to recognize the six year molar. Parents who would be horrified if told they neglected their children, lavish every other care upon them and in blissful ignorance rob the child of its greatest asset in life, a clean healthy mouth. Fathers who know every part of their motor cars knowing what is necessary to get power out of the machine permit their child's mouth to remain to them a sealed book, often such a mass of corruption and decay that the child not only cannot climb the hills of progress in school, but slips back weakened by malnutrition and septic poisoning until it falls a victim of one of the infectious diseases.

"An unclean mouth is the prize bacterial garden of the world." Cavities in decayed teeth form natural incubators for the growth and development of pathogenic germs, over twenty varieties of which have been found in the mouth. A child with its vitality lowered from malnutrition and septic poisoning and its mouth a mass of uncleanness and decay, the breeding ground of disease organisms becomes a dangerous factor in the health of the community. There is not only the danger that the child itself fall a victim of one of the specific diseases, the germs of which may be found in the mouth, but that, itself free from clinical evidences of the disease, it may be scattering disease broadcast among those with whom it comes in contact. A few thousand children with mouths full of uncleanness and disease are a more serious menace to the community than a much greater amount of uncleanness in other situations that are already covered by health by-laws. The time is coming when this fact will be recognized in this country, and when children will be excluded from school who have uncared for and unclean mouths. A school child at present is expected to have his shoes clean, and rightly so, while its mouth may be just as unclean as an uncared for mouth can be. It is unfortunate for the race that conditions were not reversed with hygiene of the mouth preceeding that of the boots.

I do not know what explanation medical men give of the fact that the so called children's diseases occur as a rule during child-

hood. It is a significant fact, however, that the seat of infection in many of these diseases is apparently closely associated with the mouth. It is an even more significant fact that these diseases usually occur at a period in life when the mouth is in the very worst condition, that is, when the temporary teeth are in place or are being replaced by the permanent set. That this is a mere coincidence is hard to believe, and I am convinced that there is a definite relationship between the prevalence of these diseases and the condition of the mouths of the majority of children at this period. This conviction has been strengthened by the knowledge of the comparative immunity of a number of children whose mouths I know to have been cared for since infancy.

The anti-tuberculous campaign is one in which all thoughtful persons are interested. It has always been a disappointment to me, and I know to other members of the dental profession, that mouth condition as a factor is the spread of this disease, and as an important factor is recovery seemed to have been largely overlooked. In no report of the work where the common treatment of the disease has been outlined have I ever seen a single reference to the mouth and teeth. I have read some of the standard works on medicine and in them also have I failed to find that the condition of the mouth and teeth are considered a factor. That they are so and particularly among children seems to have been definitely proven in many cases. In an examination of children in two schools of this city 37 per cent. were found with enlarged glands. The experience of the dental profession is that in practically every case of alveolar abscess in connection with the lower teeth there is more or less enlargement of the neighboring glands. That some of the glands in such cases are tubercular has been established beyond question. While Dr. Osler mentions only the tonsil as a mode of entrance, Dr. Geo. W. Cook, of Chicago, and a number of German investigators have found the bacillus in the cavities and root canals of teeth and in the neighboring glands, when there was no other evidence of the disease on the most careful examination and where the tonsil was healthy. In children, as the roots of the temporary teeth are gradually being absorbed there is a large opening through the end of the root, so that where cavities penetrate to the pulp chamber there is a direct funnel shaped opening leading to the tissues of the apex of the root. The same condition obtains in the six year molar when a large cavity and death of the pulp have occurred before the root is completely formed and closed at the apex. This is the most direct route by which the bacillus can reach the glands and is undoubtedly a most important factor in tubercular infection of these organs. The present universal neglect of children's teeth, with the consequent inability to masticate; lowered vitality and septic poisoning is a predisposing cause to tuberculosis which cannot be overlooked, and I feel that there should be no more enthusiastic advocates of the gospel of mouth hygiene than those directly interested in the prevention of this widespread disease.

I have referred thus far to these conditions only as a factor in disease. There is a corresponding effect on the child's mental efficiency and deportment. Dr. Gulick has estimated that two decayed teeth will keep a child back six months and adenoids a year in the school course. No child can attain a high standard for scholarship with diseased and aching teeth. Many of the so-called "backward children" are so partly, some entirely from faulty mouth conditions, adenoids and enlarged tonsils. The greatest handicap our educational system has ever had has been the mistaken attempt to produce a sound and cultured mind in a unsound body. This has been clearly demonstrated in Cleveland recently.

A special class was organized called the "Marion Street School Dental Squad." These children were picked from those having the worst mouths in the school. Their class standing was recorded, and special psychological tests conducted by Professor Wallin. Their mouths were then put into good condition and kept so by regular care. At the end of six months the tests were repeated and class records again recorded. Although in some of the mouths the work covered a large part of this time the average gain in proficiency of this class was over 54%. The principal of the school, Miss O'Neil, although at first inclined to doubt is now perhaps one of the most enthusiastic oral hygiene workers on this continent. She says it has revolutionized her school, as the influence has spread beyond the class itself. As a result the school, while formerly in the class of those where the "repeaters" outnumbered those who take two terms in one, it is now among those where the reverse condition obtains.

A mouthful of aching, sore teeth has the same effect on the child that teeth has on the infant. The "bad" boy is often only as bad as his teeth. The vicious tendencies in some children very often have a physical cause. I had the opportunity this summer of seeing the "Marion Street School Dental Squad." One boy had been the terror of the school, had been frequently expelled and was altogether the worst pupil the principal has ever encountered. As I saw him with his mouth in healthy condition he was a thorough young gentleman and has continued so. The increased self-respect, fostered by mouth hygiene, would in itself be worth any effort.

It has been impossible for me in this short paper to more than touch upon a few of the aspects of this question. A great deal of what I have been compelled to leave out is possibly as important as what I have been able to include. The subject is one vitally connected with good health and good citizenship. As a health problem, and as an economic problem the question of the mouth health is one of widespread interest and one deserving of every effort toward the happy solution that the preventable nature of present conditions makes possible.

THE IMPORTANCE OF ORAL AND DENTAL CONDITIONS.

W. P. CAVEN, M.D., B.A., TORONTO, CANADA.

Read before the Academy of Medicine, Toronto.

This section is to be congratulated in its selection of a subject for discussion to-night. Along the line of preventive medicine, I do not know that there is a more neglected field or a more fertile one than the oral cavity. Men, money and time have been freely sacrificed in the bacteriological investigation of rats, mice, mosquitoes, flies, and even the pediculus corporis, but what about the mouth. Does not this look as if we have been straining at gnats and swallowing camels?

A change, however, seems to be on the way, and the medical profession, and to some extent the public are beginning to realize that one of the causes greatly affecting public health is the widespread occurrence of oral sepsis. I take it that one of the main objects of our meeting to-night is to still further waken up the medical profession along these lines.

How many of us have to subscribe to these sentiments of Dr. Erskine Young, when he says, "In my medical days, I gave some special study to neuralgia, to insanity, to chest diseases, diseases of children and gynecology. But I frankly admit that odontology was conspicuous by its absence. During the time I was engaged in medical practice, I suppose I did not look at the teeth of six patients in six years."

To be perfectly candid, has not the medical profession considered the oral cavity as being without the pale of medicine except that it was the receptacle from which the tongue was protruded, and the dentist as a mere mechanic.

But a great change is now taking place and we are recognizing the very important part that dental caries and oral sepsis play in the health of the community; and we also recognize that the dentist is a member of a learned profession carefully and scientifically trained, and that this whole question of oral sepsis must be handled by the physician, surgeon and dentist working hand in hand.

From the physician's standpoint, therefore, I want to direct your attention briefly to the state of the mouth in relation to certain diseased conditions, at a distance. I will not refer to all those symptoms of dyspepsia and gastritis which may owe their origin to inability to mechanically masticate the food properly by reason of diseased teeth, but rather to those depending upon absorption of toxine and bacteria into the blood stream, or from the swallowing of pus containing toxine and bacteria.

The secondary infection of the parotid gland as met with in cases of typhoid fever is a striking illustration of the effect of a septic mouth. Not only is this foul condition manifested locally in

the parotid, but I have time and again been struck by the improvement in general conditions which follows the cleaning up and disinfecting of the oral cavity in patients who have been admitted to the hospital in a neglected state.

The mucous membrane of the mouth and throat is undoubtedly one of the gateways through which the tubercle bacilli enters. In consequence of sepsis, a catarrhal condition of the mucous membrane may be produced, which of itself may set up a simple adenitis. But this is not the end. The resistance of the tissues is thus greatly impaired and this is all the omnipresent tubercle bacilli need to enter the field and flourish and bring about a tuberculosis of the lymph glands.

That septic infection of the mouth plays a considerable part in bringing about gastric and intestinal sepsis as well as the various anemias, I consider undoubted.

Mention of this subject at once brings to our mind Hunter's work in this connection. One of the bases which suggested to him observing the condition of the teeth and oral cavity, in relation to septic infection, was that of a case of subacute gastritis, caused and kept up by three suppurating teeth and permanently cured by removal of these teeth.

One naturally asks is the healthy stomach not capable of resisting the pyogenic and other organisms swallowed from the mouth with cario-necrosis of the teeth. Hunter points out that even in health the power of the stomach to destroy such organisms is not complete and that such power is due to the presence of free Hcl.

With rotten teeth incapable of proper mastication and a mouth foul with pus, the next step almost of necessity is the occurrence of a catarrhal gastritis and consequent diminished Hcl. In time, therefore, the catarrhal condition of the stomach and gastritis which at first may only be of an irritant nature, the result of fermentation, becomes septic in character due to actual septic infection of the mucosa.

Nor need the infection stop here, but many of the infective processes which we dismiss as of obscure origin such as osteomyelitis, meningitis, ulcerative endocarditis, owe their origin to local suppurative conditions in the mouth, jaws, tonsils or pharynx.

Of late years, I think all physicians are alive to observing the condition of the mouth, teeth and tongue in pernicious anemia. My own observations lead me to conclude that glossitis and stomatitis are early symptoms in at least 60% of cases, and that cario-necrosis of the teeth is usually their antecedent.

Hunter's conclusions are:

1. Pernicious anemia is a chronic infective disease.
2. It is the result of a special infection of the digestive tract, especially of the stomach, frequently also, although to a less degree, of the mouth and of the intestine.
3. The chief source of the infection is oral sepsis, arising in con-

nection with long continued and neglected cario-necrotic conditions of the teeth.

In discussing the subject of oral sepsis or of sepsis of the adjacent mucous membrane and tonsils, rheumatic fever at once comes to our mind. Rheumatic fever presents all the clinical features of an acute infection, the fever, sweats, joint involvements, leucocytosis and involvement of serous membranes.

Where is the portal of entrance of the infection? Undoubtedly in many cases through diseased and infected tonsils and adjacent mucous membrane. I do not mean to say that this is the only portal, but certainly it is one and a very important one.

I am sure this is the experience of all of us and I need not quote cases of which I have records, but just one point, that often a small innocent looking embedded tooth root is the worst sinner.

Before closing my remarks, I would like to refer to a recent article on the bacteriology of the tooth brush (by Smale and Carmalt Jones). The effect of their investigation will, I think, be to make us all adopt a better technique in our care of the teeth, and the tooth brush.

Their conclusions are as follows: "A tooth brush becomes septic after once using, each hair becoming an inoculation needle, and the person using it may be vaccinated with such germs as flourish upon it. The tooth brush, therefore, as popularly used, namely, for many months, may be the origin of pyorrhea alveolaris, which may lead to such grave consequences as we have just been discussing. The prevalent tooth powders and paste as usually used do not render the brush aseptic and even perhydrol and 1 in 20 carbolic acid is not effectual in so doing. How can this be met?

1. All tooth brushes before and after use to be boiled five minutes.
2. A new tooth brush can be used each day.
3. Those wishing for a more prolonged use of a tooth brush, can rinse the brush in trikresol 1%, or allow it to stand between use in formaline 10%.

ORTHODONTIA.

GUY G. HUME, D.D.S., TORONTO.

Read before the Academy of Medicine, Toronto

The increase of the mal-relation of the teeth is due in no small degree to the environment of the children of the present day.

The prepared foods which parents give their children and which do not require very much trituration have a great effect upon the lack of development of the muscles and bones of the lower part of the face. If the teeth do not perform the functions which nature planned they should, then some economical factor is going to suffer. A lack of proper mastication means a lack of proper assimilation,

consequently we find that children who have not a proper masticating apparatus deficient in physical development and quite frequently lacking in mental ability. If we could have the co-operation of the medical profession who see the patients in some case years before they are taken to the dentist, and who have the privilege of advising as to the diet of the young child, many of these abnormal cases could be prevented in early life.

In advising as to the diet of children is it not possible to do away with the soft, mushy foods, and give foods which require a good deal of mastication before they can be swallowed? We recognize how perfectly the medical profession have worked out the correct proportion of the different diets for infants and children, as to the component parts as to proteids, carbo-proteids and fats, but we believe there might be a better selection with a view to the development of the bone and muscles of the jaws so that the teeth would have to perform their normal functions. It cannot be impressed too emphatically upon parents—the necessity for the thorough mastication of the food by the child. A very interesting study in this connection has been made by Dr. Ottofy, who has made a very thorough examination of a race who have not come under our so-called civilization. He finds that in the Igorrotes (Igorots) there is no mal-occlusion of the teeth and only two per cent. of caries. He attributes this to their manner of living and the foods which they use: Their food consists chiefly of rice and camotes—a kind of sweet potato—neither of which is cooked to the point of disintegration, consequently the teeth have to perform their normal functions of thorough mastication. This diet is followed out in the young child and they are given hard substances to chew between their meals.

How often people are judged from their facial expression! In a great many cases the true character can be read from the face, while in others it is not fair to place them as having a weak character when some mal-occlusion of the underlying structure is causing a mechanical obstruction to the balance of the features of the face. I have had several marked cases in my own practice which have demonstrated to me what a wonderful change can be brought about in the personality of the individual when normal conditions are established. The passing away of the reticence of some patients due to the consciousness of their facial features—when a harmony of the features has been brought about—the improved mental ability of others when mal-occlusions have been corrected. When such changes can be brought about for the benefit of the patient we feel justified in making these changes even though the treatment should extend over a considerable period of time.

The work of the rhinologist and that of the orthodontist is being brought much closer together to-day than it was formerly. Each is dependent in certain cases to a certain extent on the other. Take for example a typical mouth-breather: here we have the patient suffering from the effect of nasal stenosis, brought about possibly

by the growth of hypertrophied tissue, and unable to breathe through the normal channel on account of the growth in the post-nasal region. In a great majority of these cases we have the Inf. teeth distal to their normal position (I do not say in all cases, because there are many in which there is a nor-mes-dis. relation). We have a lack of development of the superior maxilla, very prominent superior incisors, we must then have a lack of the balance of the facial features. If the rhinologist does the best he can for the patient he must consider the occlusion of the teeth, otherwise, he cannot break the patient of the habit of mouth-breathing—in other words—normal occlusion must be established before there can be a balance of the facial features. Looking at the case from the standpoint of the orthodontist, he cannot hope for success until the obstruction in the post-nasal region is thoroughly removed by the rhinologist before he attempts to bring the teeth into normal occlusion. Normal occlusion does not only imply a normal mesio-dist. relation, but it means a buccal-lingal relation. This can be determined from a scientific study of the arches. This idea of pre-determining the arch has been established on scientific principles by Dr. Hawley, of Washington. Given the type of tooth, an arch can be constructed which will be absolutely correct: so that it is not a matter of the eye, as to how far an arch must be expanded: but it can be determined, as stated before, by actual measurements according to type.

Prevention should be aimed at rather than cure—hence it is advisable to have patients just as young as possible so that there will be a greater opportunity to bring about normal development. If we make a histological examination of the non-erupted permanent teeth and study their relation to the deciduous teeth in the arch we cannot but see what a great influence may be brought to bear upon these permanent teeth by the changing of the deciduous teeth, consequently, if we have a lack of development in the deciduous arch we may prevent the same condition occurring to the permanent teeth by the early correction of the deciduous mal-relation. In saying that a case should be treated while the patient is as young as possible, I mean by that, just as soon as there are conditions existing which justify our operating. Cases should be diagnosed from the condition of the deciduous teeth. How frequently we hear the remark from mothers that "The child's baby teeth were so even and close together!"

Studying the development of the arch we find that the mandible grows forward and upward, while the superior maxilla grows forward and downward. In the deciduous denture there should be a marked lateral development, so that between five and six years of age the central incisors should be so separated that there is at least the space of 2 millimeters between them, also there should be a similar spacing between centrals and laterals and laterals and cuspids—cuspids and first deciduous molars. At least a space so that a ten-cent piece could be easily passed between them. This lateral

expansion is. I am sorry to say, not sufficiently recognized by a great number of the medical profession as well as by some of the dental profession.

Some of the cases which I purpose showing slides of have been left entirely too long in order to gain best results. I am showing some typical cases of the different classifications in which there is marked lack of facial balance due to certain conditions of mal-occlusion. The old idea of waiting until all the permanent teeth have erupted before attempting to correct the mal-occlusion of the teeth has been dissipated. The correct time is, just as soon as there is shown to be a lack of development—then there should be used some force to stimulate the growth which has been lacking in development.

If mal-occlusion has developed in a case it naturally follows that a longer time must be taken in order to correct, rather than in preventing it. The older the patient becomes before correcting the mal-relation the longer the period of time for retaining the case must be. In my opinion for certain cases of mal-occlusion it is not always advisable to correct the condition after the period of adolescence, considering the treatment which the patient has to undergo. The advisability of extracting a tooth to correct mal-occlusion is almost obsolete. Every tooth in the arch has an individual part to play in the maintaining of the normal arch, and no tooth should be sacrificed.

PYORRHOEA ALVEOLARIS.

A. J. McDONAGH, D.D.S., TORONTO, CANADA.

Read before the Academy of Medicine, Toronto.

I assure you it affords me a great deal of pleasure to be with you this evening, and I appreciate the honor.

The subject I have been asked to speak upon, Pyorrhea Alveolaris, is an unfortunate title, because pyorrhea alveolaris is a term used popularly to express a number of diseases, whereas it really means only one condition of things, the result of several diseases.

Taking it in the broad meaning which is given to it, we must divide it into two classes of disease, to understand what we are talking about, therefore, we will speak of gingivitis and alveolar osteoclastm.

We will first consider a case of simple gingivitis (the gingive being the soft tissue through which the tooth is born). It is not necessary in such a case to have ulitis or stomatitis, although ulitis is often a secondary condition. We can and do have very often gingivitis advanced to such a stage that the congestion of the gums at the margin and in the interproximal spaces is so great that the tissue dies and we have what appears to be gangrenous gum.

This dead tissue very often extends to the surrounding tissue, and we have what is called ulcerative gingivitis, a condition which is often met with by the general practitioner and which is nearly, if not always, connected with some constitutional disorder, whether it is the result of disturbance in the intestinal tract or a specific disease or the like, showing itself in the gums must be decided by the consultant. One thing is certain, if the blood circulation of the patient is in perfect condition and the mouth is kept clean, he will not have ulcerative gingivitis.

This condition as a rule yields comparatively readily to treatment and must usually be taken care of by the dentist and the physician at the same time. But there is a condition of gingivitis which is caused by deposits on the necks of the teeth, making a mechanical irritation. Those deposits have their origin in the saliva and are sometimes the cause of alveolar osteoclastism or breaking down of the alveolar bone.

We find a great many mouths in which there is a great quantity of salivary calculus, commonly called tartar, deposited wherever it can conveniently form, and yet there is very little inflammation of the gum, and we find cases where there is very little tartar and quite an extensive inflammation of the gum. Sometimes we find no deposit, and yet there is pus oozing out from the gum margin, and the bone is being broken down.

Another condition which was first described by Dr. Black, and which he calls phagadenic pericementitis, is characterized by the death of the pericementum, without the discharge of pus and with no deposits to be found upon the root, the pericementum being the tissue which performs the same office for the tooth-root as the periosteum does for the bone.

Another class of this disease is what is called rheumatic pyorrhoea. In this particular class, the disease takes place on the root of the tooth without any connection at the gingival border. The pericementum and the alveolar bone die, and an abscess is formed to gain access to which one must make an incision in the gum tissue over the root of the tooth, and you will sometimes find a deposit on the root at that point, the removal of which and the curretting of the bone around it nearly always effects a cure. These are the rarest cases, very seldom met with in general dental practise, and not very often even by the specialist. They are the cases which perhaps are the result of rheumatic diathesis.

How many cases of rheumatism are the result of pyorrhoea, I am unable to say; certain it is that a great many cases of rheumatism have been either cured or greatly benefitted immediately after the pyorrhoea has been cured.

Patients often come into a dentist's office and will tell him that the pyorrhoea has been caused by rheumatism; however, on inquiry you invariably find that they have had pyorrhoea to their own knowledge from one to ten years before they had any symptom of rheumatism, and that notwithstanding the fact, that it is a rare

thing for a patient to know pyorrhoea until it has been developing for a year or two, unless in cases where the pyorrhoea is the direct result of nervous shock or great worry, in which case the development is very rapid.

It is said that no person over forty years old, whose gums have not been treated by a dentist, is free from a gingival irritation, and probably that is true, but many persons have not enough inflammation there to cause any serious trouble.

We can readily see that the man who is to be successful in treating the different phases of gingivitis and alveolar osteoclastism must have a knowledge as to the cause of the trouble and the best means of combatting it. That part of the discussion of the subject, however, does not interest this meeting, and I will pass it over, but Dr. Talbot's theory and Dr. Timothy Leary's theory, which fit in so nicely together, do interest us, as does also the rheumatic diathesis theory.

Dr. Talbot has done a great deal to establish the fact that this pathological condition is the result of faulty metabolism, faulty assimilation and auto-intoxication.

Dr. Talbot says, the blood stream becomes vitiated and thickened and is not capable of being forced through the smaller variety of blood vessels contained in the alveolar bone and the pericemental tissue, the result, of course, being that the blood vessels in these tissues become congested at a time when through the stimulation of auto-intoxication the heart's action is increased necessarily, causing deterioration and breaking down of these blood vessels.

If a micro-organism, such as the fusiform bacillus, which is always in the mouth, is capable under certain conditions of changing from a benign to a pathogenic organism, then the conditions under which this takes place are certainly interesting to both lay and professional men.

Let us consider the anatomy of the part affected.

If the free margin of the gum cannot prevent the fluids of the mouth which contain numbers of organisms, including the fusiform bacillus, from passing up and attacking this congested tissue, there is nothing more certain than that we are going to have an infection at this particular point. Once the micro-organisms obtain a foothold they are capable automatically by their own toxins and ptomaines of destroying the pericemental tissue and the alveolar bone, and certainly their progress will be accelerated or retarded according to the resistive power of the blood—call it opsonic index if you like. This knowledge has given rise to a treatment which some dentists and some physicians have used to combat the disease.

Dr. Goadby, practising dentistry in England, used opsonic vaccines quite extensively, and had at least some temporary success.

But perhaps, as Dr. Timothy Leary says, he was mistaken in the vaccine he used.

The fusiform bacillus, to which Dr. Leary attributes this disease, requires some other organism, such as the staphylococcus or the streptococcus, to go along with it, in order to produce pus, and you may destroy the pus formation and still have the foundation of the disease left, but no matter what vaccine you used it would be impossible to have very many, if any, permanent successes, because after the disease has been in progress the pericementum is dead, the tissue of the tooth root is infected where the blood does not reach it readily, and deposits have been formed on the root by the serum of the blood the mucous cells and the *debris* of the alveolus.

That is why all treatments by opsonic vaccine for pyorrhoea have been failures.

As this disease progresses, very often the patient becomes weakened, the tooth becomes loosened, and even the power of mastication becomes lost to the individual.

Dr. Hunter, in speaking of this subject, says: Ninety-five per cent. of the cases of pernicious anaemia which come under his notice are a result of infection from the mouth, that numbers of cases of indigestion have been traced to unclean and unhealthy mouths. He thinks a great deal is due to cavities in the teeth and to bridges and crowns being improperly made. Probably to a great extent he is right, but he seems to forget, or possibly he does not know, that millions of the germs produced in the mouth are produced in pockets covered by the gum tissue, which to the eye of the general practitioner, either dental or medical, are not observable.

I have here a cast of the upper jaw in a man's mouth. You can see for yourselves that the gum tissue appears comparatively healthy, and yet this wire which extends up into the pocket underneath the gum is fully three-quarters of an inch long. Does it not seem that the possibilities of harm from this baneful disease are almost unlimited?

In order to show what condition may obtain in an ordinary case of pyorrhoea, I have made a cast showing an ordinary case of pyorrhoea. You will observe that in this cast there are two pieces of orange wood, which indicate the depth to which the disease has extended, on measuring them we find that the depth is three-eighths of an inch.

I have here two wire measurements, showing respectively the circumference of the first molar tooth at the gum line, and of a lower incisor at the gum line.

Striking an average, the circumference is little more than $1\frac{1}{8}$ inches; there are 30 teeth in the patient's mouth; therefore, about 34 inches is the circumference of all the teeth at the gum line; multiply this by $\frac{3}{8}$ of an inch and you have over 12 square inches of absorbing surface in that patient's mouth, and held in

direct contact with that surface, you have a quantity of pus filled with all kinds of micro organisms, in some cases the staphylococcus predominates, in others the pneumococcus, in other cases the short chain streptococcus, and Dr. Leary says in every case which he has examined the fusiform bacillus has been found.

Supposing on any other part of the human body we found 12 square inches of absorbing surface, would we expect to have serious constitutional disturbances—would we think it possible to get as a result pyemia or empyemia or rheumatism or anaemia, or, in fact, a great number of diseases?

Surely a wise Providence must have provided in some way to combat this absorption, possibly by raising the opsonic index of the blood in that particular part of our anatomy.

Another way the poison is taken into the system is by becoming mixed with the food or the fluids of the mouth, and in that way being carried into the digestive tract.

Miller says, one-third of the germs which pass into the stomach of the individual in an ordinary state of health are not taken care of by the gastric juice. How many pass through to the intestines of a patient suffering from pyorrhoea he does not say, certainly a great many more, because every mouthful of food is infected with this pus from the pyorrhoea pockets by the force of mastication, like the poison of a rattlesnake when its fangs strike home.

The question is often asked, Is this disease curable? The answer to that depends on what you mean by curable. If you mean is it possible to stop any lime salt deposit around the necks of the teeth or to eliminate all micro organisms from the mouth, it is not possible. If you mean, is it possible to restore to a condition of health and usefulness a mouth in which all the alveolus has been destroyed and all the teeth are loose and rotate in their sockets, it is not possible.

But if you mean by being cured a restoration of teeth which do not rotate in their sockets to their normal usefulness by inducing the tissues to form healthy around the roots of the teeth and to stop the discharging of pus, then most assuredly it is possible to effect a cure, and a skilful operator will be successful in over ninety per cent. of all cases which present themselves, although some of the teeth in the mouth may be so loose that they rotate in their sockets.

Will the disease recur after being cured?

Without doubt, there is a possibility of recurrence, the same as there is a possibility of the recurrence of any other disease of the body, but there is not as great a likelihood of recurrence if the patient is properly instructed as there would be if he did not receive any instructions.

A great deal depends of course upon the skill and the care the operator lends to his work and the faithfulness with which the patient carries out his instructions.

ELECTRICITY FOR DENTISTS

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CHAPTER III.

ELECTRICAL UNITS AND ELECTRIC CONNECTIONS.

There is a close analogy between electric energy in wires and water flowing in pipes. Suppose that a city had a system for distributing power in water driven through a system of pipes.

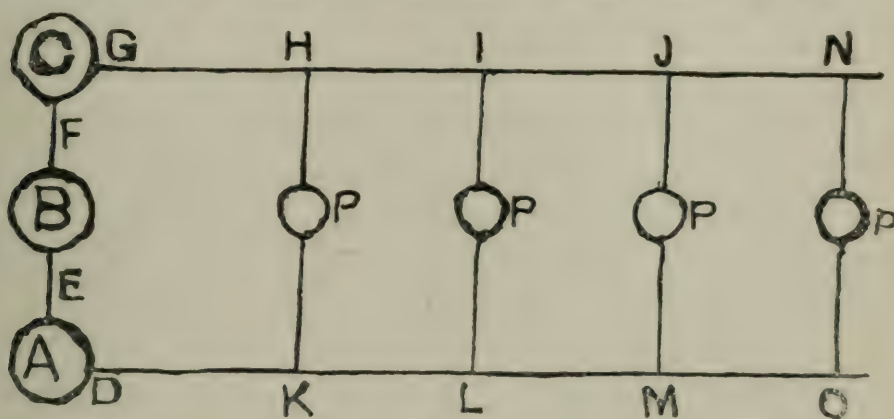


Fig. 7.

In Fig. 7 let A, B and C be three pumps, each capable of discharging 100 gallons a second under a pressure of 100 pounds per square inch. A will receive the water at D and deliver it at E, 100 gallons a second at 100 pound per square inch pressure. Anybody is mechanic enough to see that B will deliver at F the same quantity, but will add its 100 pounds per square inch, and that there will be delivered at G 100 gallons per second at 300 pounds pressure. The water may flow freely in the pipe G N, but there is always resistance to water flowing in a pipe, especially if the pipe be long and be small in diameter for the amount of water that passes in it. We can easily see that the pressure at N will be reduced just in proportion to the length G N, which may be several miles. We must suppose that all water be returned to the pumps in the pipe O D, which also offers resistance to the flow. The larger the conducting pipes the less will be the resistance. At N K water power P is delivered to a customer. The amount of power delivered will depend on the difference in pressure at H and K and in the amount of water flowing from H to K. The same holds true at I L, at J M and N O, but the difference in pressure becomes reduced as we get farther from the pumps, and we must use proportionately more water to get the same power. In Fig. 8 let A, B and C be three electric generators, each capable of generating 100 amperes per second of electricity at a pressure of 100 volts. There will be delivered at E 100 amperes at 100 volts and at F 100 amperes at 200 volts, and at G 100 amperes at 300 volts pressure.

We speak of the difference of potential (electric pressure) between D and E as 100 volts, or between D and F as 200 volts, and the

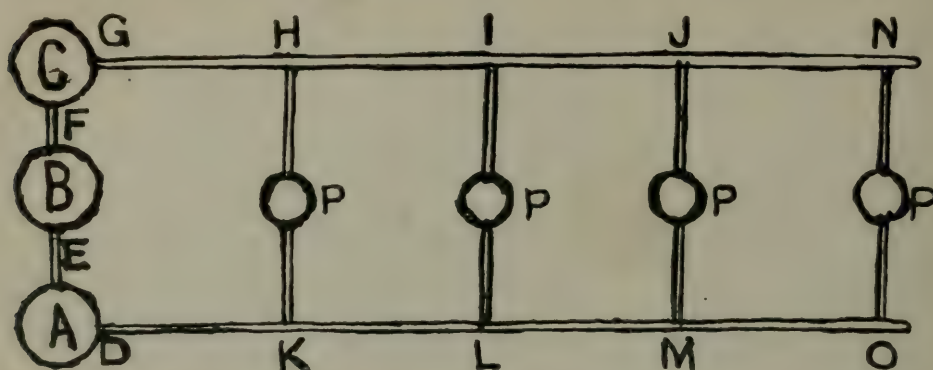


Fig. 8.

difference between F and G would be 100 volts. The same reasoning as in the water system holds true in regard to the electric current in the wire G N and O D in the resistance to the flow of electric energy and the consequent fall of potential at N and D. The larger the diameter of the wire and the better the material for conducting the less will be the fall of potential. It is also evident that the voltage is higher at H K than at N O. A motor for obtaining power or a lamp for light offers resistance. If the same resistance is offered at H K as at N O there will be obtained less power at N O just in proportion as the voltage is reduced at N O and as the amperes are used at H K, I L and at J M. This accounts for our electric lights becoming dimmer as we are situated farther from the supply centres and as the current (amperes) is consumed by other customers, as for instance in the evening when all the lights and motors are in operation. Electric supply companies endeavor to supply current in proportion as it is used by consumers. The peak load often taxes the conducting capacity of the wires and, is an important problem for electrical engineers as we may see later.

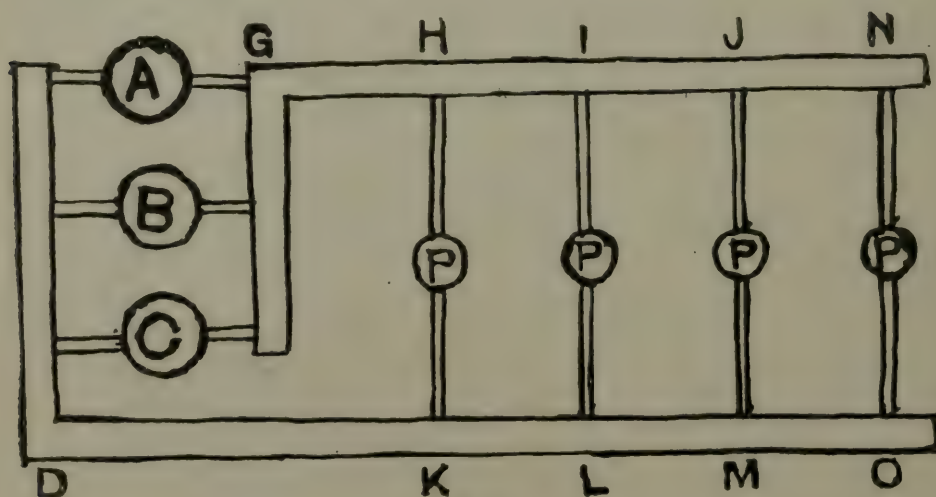


Fig. 9.

As with the water the power (P) developed at any place depends on the pressure and on the volume flowing, so with electric currents,

the work done varies directly as the amperes flowing and the pressure in volts driving the amperes through and therefore is the product of the volts and amperes. A unit of work of any kind done by electricity is called a *watt*. Thus in the electric system referred to in Fig. 8 the generators are capable of delivering 30,000 watts of electric power (100 amperes x 300 volts). For large amounts of electric power it is more convenient to have a term that means 1,000 watts and the name *kilowatt* is used. Hence, 30,000 watts equals 30 kilowatts. Electric generators connected as in Fig 8 are said to be connected in series.

Suppose we arrange the pumps differently as in Fig 9. If each of the pumps A, B and C are capable of delivering 100 gallons a second at a pressure of 100 pounds a square inch it is evident that the three will deliver 300 gallons at a pressure of 100 pounds. It

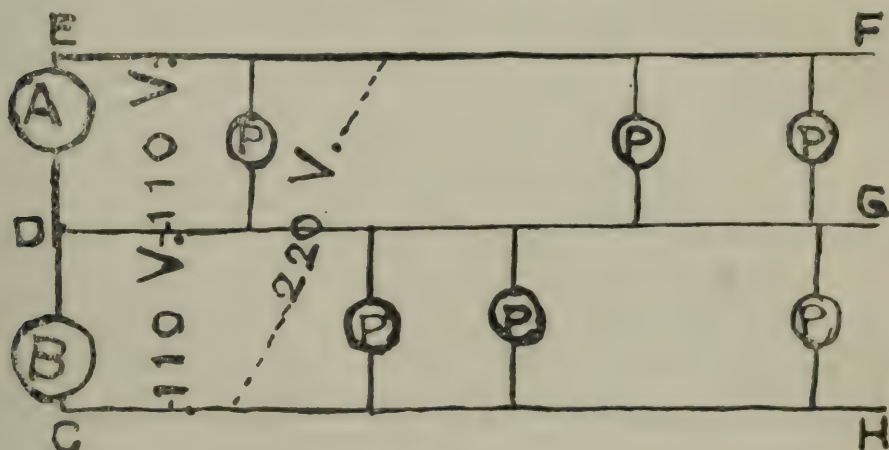


Fig. 10.

is evident both because of the reduced pressure and because of the increased volume that the pipe G N and D O must be very much increased in size, else the friction or resistance will be too great for the pipe to deliver the same amount of power as in Fig. 7. The pipes G N and O D must have nine times the capacity to deliver the same power. And the motors P must be constructed to take more water at less pressure to deliver the same mechanical power.

Again, suppose that in Fig. 9 A, B and C are electric generators as in Fig. 8. Then in Fig. 9 this arrangement would deliver 300 amperes at 100 volts pressure. Electricity in passing through a wire always heats the wire. *The amount of heat varies as the square of the current in amperes* (in this case 300) *multiplied by the resistance of the wire*. Unless in an instrument where the heat is made use of, this heat is all waste. To reduce the resistance there must be large conductors, and these for long distances are costly. There is evidently much financial gain to companies supplying electricity that the amperage be reduced as much as possible to reduce the waste in heat. We can also see that this may be accomplished by increasing the voltage, since $\text{Watts} = \text{Volts} \times \text{Amperes}$ and Watts means power. Reference will be made to this in a sub-

sequent chapter in dealing with the commercial distribution and control of electricity.

An arrangement of generators as A, B and C in Fig. 9 is said to be connection in *parallel* or *multiple*.

From the above the three wire system that is so common is easily understood. In Fig. 10 let A and B be two *dynamos* or generators each capable of delivering 50 amperes at 110 volts, and connected in series. Between A and B let a third conductor D G be carried parallel to E F and C H. Then between the centre and either outside wire there will be 110 volts, but between the two outside wires 220 volts.

We have seen how that every conductor, even the best offers resistance. Resistance must be taken account of as much as amperes or volts. The unit of resistance is called the OHM. The following relationship always exists between Amperes, Volts and Ohms.

$$\begin{array}{rcl}
 & \text{Volts} & \\
 \text{Amperes} & = & \frac{\text{Volts}}{\text{Ohms}} \\
 & \text{Ohms} & \\
 \text{Or Volts} & = & \text{Amperes} \times \text{Ohms} \\
 & \text{Volts} & \\
 \text{Or Ohms} & = & \frac{\text{Volts}}{\text{Amperes}}
 \end{array}$$

This is called Ohm's Law.

Instruments for measuring amperes are called *ameters*. Very small currents are measured in one thousandths of an ampere called milampers. The measuring instrument is called a *milameter*. Our pyrometer or cataphroic appliance records in fractions of a mil-ampere. When it is desired to know how many amperes an instrument consumes the ameter is connected in series with it. An instrument for measuring volts is called a *voltmeter*. A voltmeter should be connected in parallel with the instrument to show the fall of potential produced by the resistance of the instrument.

The amperes and volts being known it is easy by Ohm's law to find the resistance in ohms. For instance our common 16 candle power lamp conducts half an ampere at 110 volts. The resistance in the lamp is $110 \div \frac{1}{2} = 220$ ohms. An instrument called the *Wheatstone Bridge* is used for measuring resistances. It contains a large degree of resistance from which may be selected any known resistance. The resistance being measured is compared with the resistance in the Wheatstone bridge until a balance is found. The reading of the bridge will indicate the resistance being measured.

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DENTAL HOSPITALS IN CANADA.

There is need of dental hospitals in Canada. How shall they be organized? Who will govern them? How shall they be maintained? Who will be treated and who will do it? These are problems to be faced sooner or later. The rapidly increasing knowledge of the value of the teeth is making the need more apparent day by day.

To get a better insight into the solution of the problems before us in Canada to-day the history of the past should be of some value. The first dental college was organized separate from a medical college because the medical college would not give a special course in dentistry to those who wished to practise the dental specialty. With the dental college came the dental hospital or infirmary. The dental hospital as an adjunct to a dental college has been for revenue and teaching purposes only. Primarily there was no thought of caring for the poor or the needy. The patient is asked

to pay as high a fee as he can afford. If there are not enough pay patients to supply the demands of the school for teaching purposes then the poor may have a chance. So in reality there are no dental hospitals for the poor even in the cities where there are dental colleges. Nor are there dental hospitals in cities and towns where there are no dental colleges.

In England the position of affairs is a little different from Canada or the United States. There dentistry was never fully divorced from medicine as in America. Dentistry is governed by the General Medical Council. The dental schools are adjuncts of the medical schools. The independent dental hospitals associated with the dental schools are organized upon a similar plan to the general hospitals. There is a board of trustees, private donations, government aid, etc. Then there are dental hospitals associated with the general hospitals, such as Guy's in London, and in many of the provincial towns and cities. All of these hospitals are organized with the idea of caring for the poor. If patients are used for clinical material and students thus get instruction it is an incident only.

The general effect on dental education and dentistry has been markedly different under these different plans. The responsibility to the public and the care of the poor have been different also.

In America, where dentistry has been completely divorced from medicine and its traditions of centuries there has been a tendency to develop the mechanical aspect of dentistry to the exclusion of everything else. It is only in recent years that a broad scientific education has been thought to be of any value to a dentist. The English plan has developed a class of cultured men well grounded in medical subjects, but often totally lacking in ability to apply their knowledge to dentistry, for the want of a fine dental technical training. Incidentally it has developed a hoard of unlicensed dentists. The American plan has developed a profession lacking in responsibility to the State or the individual. So long as he has a busy practice it matters little to him whether the poor are cared for or the public are educated to appreciate the value of dental services or the State authorities are brought to enact measures which will preserve the health of the nation. The patient in the college infirmary is there for the students' convenience, and the patient for the graduate is present that he may make a living. In the United States there are now being organized many dental hospitals wholly independent of general hospitals.

With this history, what are we going to do in Canada? Since diseases of the teeth are most prevalent in childhood and young adult life, dental examiners are being attached to public and high schools. Those who are able to pay for dental services are attended by the family dentist, but a large number cannot afford such services, and the State finds it necessary to provide it. In many cases the authorities agree that they now have organized hospitals with all the machinery ready for such work except the dentist and

the special equipment. Dentists trained under the American system of independence of medicine fear that a department of dentistry in a general hospital would not be run with the freedom of one organized independently. In some cases these fears might be well founded, but in the vast majority of hospitals where there is a lay board of directors there should be no such fears. The advantages far outweigh any disadvantages.

It is clear that there are two general methods of organization. One as a department of a general, the other as an independent hospital. As a department of a general hospital the cost of administration would be much less. Nurses would always be present as assistants and might be trained as dental assistants, for which there is a great need. When anaesthetics are administered nurses would be present to care for the patients. Patients could be put to bed after an operation. Many minor dental surgical operations could be done in the dental department which are now done in the general surgical department. The dental department would bear the same relation to the hospital as the ophthalmic department or any other department. The only objection to this arrangement would be jealousy of the general medical and surgical staffs. Such a department would be an ideal training school for dental students. McGill dental students get their training in the Montreal General Hospital. A similar department is now being organized in the Winnipeg General Hospital. It is anticipated that the Dental Department of Manitoba University will use it as its clinical department. The dental students of the Royal College of Dental Surgeons of Ontario get some training in extracting under general anaesthetics in the Toronto General Hospital under the guidance of Dr. A. D. A. Mason, the dental surgeon to the hospital. There is no reason why the department should not be enlarged and given its proper recognition.

The independent dental hospital for the care of the poor requires a complete organization of its own. Municipal and philanthropic aid would maintain it. Dentists would likely be on the board of management. It would be run with little or no red tape. As a means of saving teeth it would be a great success. It would be as impossible to treat diseases of the mouth associated with teeth as it is now in the average college infirmary. As a means of clinical teaching its value would be doubtful. In either case dental operators would have to be paid a salary. Such an institution should come under the Department of Public Health.

Who should be treated and who should do it and the relation of these to the State we shall leave for discussion along with State dental education, which will be taken up again.

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Proceedings of Dental Societies

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Hon. President, A. V. Lester ; President, R. T. McDonald ; Vice-President, G. Everitt ; Secretary, F. W. Williamson ; Treasurer, C. M. Ross ; Archivist, J.A.C. Hoggan ; Programme Committee, R.H. Cowan, E. Kelly, J. A. C. Hoggan ; Educational Committee, J.A.C. Hoggan, H. M. Morrow, R. T. McDonald ; Ethics Committee, J. E. Overholt, O. Clark, R.T. McDonald ; Dinner Committee, J.E. Johnstone, W. J. Bell, W. G. Thompson.

Officers of the Canadian and Ontario Dental Associations.

OFFICERS CANADIAN DENTAL AS- SOCIATION.

President—W. D. Cowan, Regina, Sask.
1st Vice-President—Dr. Bush, Winnipeg, Man.
2nd Vice-President—Dr. W. G. Thompson, Hamilton, Ont.
Secretary-Treasurer—Dr. Barbour, Fredericton, N.B.

OFFICERS OF THE ONTARIO DENTAL SOCIETY.

President—W. R. Greene, Ottawa.
Vice-President—J. A. C. Hoggan, Hamilton.
Secretary—E. C. Jones, Dundas.
Treasurer—F. W. Williamson, Hamilton.

JOINT EXECUTIVE.

Programme Committee—R. T. McDonald, George Everitt, W. J. Griffin, J. A. C. Hoggan.

Entertainment Committee—W. J. Thompson, J. E. Johnstone, D. Clark, J.W. Bell, H. P. Moore.

Clinic Committee—O. S. Clappison.

Supervisor of Clinics—E. Kelly, F. W. Williamson.

Exhibit Committee—R. H. Cowan, A. C. Burnett.

Transportation Committee—J. F. McDonald, E. M. Fulton.

Publicity—J. A. C. Hoggan, A. V. Lester.

CANADIAN DENTAL ASSOCIATION AND ONTARIO DENTAL SOCIETY.

Dental Canada will visit the old family home on June 3rd, 4th, 5th, and 6th, 1912. The Canadian Dental Association will join hands with the Ontario Society in doing the honors.

No better place could be chosen for such a reunion than the Brant Hotel, in the little old town of Burlington.

The very atmosphere has a charm of blossoms, of fresh earth, of sun, and even rain that gladdens the soul in June. Burlington Beach is one of those points on the road between Toronto and Hamilton that is gradually building up for itself a romance of ivy and stone walls that some day will be one of the greatest treasures of the sister cities.

Hotel Brant contains one hundred and fifty rooms, a magnificent porch looking out across Lake Ontario and Hamilton Bay. The dining-room alone will seat three hundred guests, and looks upon twenty bowling greens on one side and beautiful tennis courts on the other.

A large Assembly Hall at the top of the house seating five hundred, with roof garden on either side, makes a unique setting for such an entertainment.

OFFICERS OF THE PRINCE EDWARD ISLAND DENTAL ASSOCIATION.

President—A. B. Reid, D.D.S., Charlottetown.

Vice-President—J. C. Sharpe, D. D. S., Summerside.

Sec.-Treas.—J. S. Bagnall, D.D.S., Charlottetown.

Drs. J.H. Ayres and A. W. Leard, Summerside, to complete the Council of five.

The next annual meeting of the P.E.I. Dental Association will be held in Charlottetown.

The union meeting of the Seventh and Eighth Districts Dental Societies promises to be one of the best meetings ever held in this end of the state.

The following gentlemen, all bearing a national prominence in their profession,

have consented to read or discuss papers :—

- Dr. H. S. Hoff, Ann Arbor, Mich.
- Dr. M. L. Rhein, New York City.
- Dr. A. C. Fones, Bridgeport, Conn.
- Dr. J. L. Kelly, Chicago, Ill.
- Dr. H. L. Wheeler, New York City.
- Dr. Arthur D. Black, Chicago, Ill.
- Dr. H. A. Pullen, Buffalo, N. Y.
- Dr. Grover Wende, Buffalo, N. Y.

We meet in the parlor of the Hotel Iroquois, away from the noise and confusion of the exhibit-room.

Several of the papers will be illustrated with stereoptic views.

Dr. Wende will address us upon syphilis, illustrating it with such subjects as he can obtain at the time.

ANNUAL MEETING OF THE INSTITUTE OF DENTAL PEDAGOGICS.

The next annual meeting of the Institute of Dental Pedagogics will be held in Chicago, January 24th, 25th and 26th, 1912. (Notice change of dates.)

The officers and committeemen have arranged a program that will be of unusual interest to every dental teacher. In addition to the excellent papers and instructive exhibits, one day has been set apart for the inspection of the Chicago schools, where all departments will be in operation.

A detailed program will be given in the next issue of this journal.

Fred W. Gethro, Secretary.

BRODIE MEMORIAL FUND.

The following amounts have been received for the "Brodie Memorial Fund":

- Dr. Corrigan, Strathroy, Ont.....\$2.00
- Dr. J. Reade, Bloor & Yonge..... 2.00
- Dr. James M. Magee, 42 Wellington Row, St. John, N.B..... 2.00
- Dr. H. E. Eaton, 631 Sherbourne Street..... 2.00
- Dr. A. E. Webster, 3 College St.... 2.00

THE EDUCATIONAL COMMITTEE OF THE ONTARIO DENTAL SOCIETY.

Executive Committee—Dr. Wallace Seccombe, Toronto, Chairman; Dr. R. J. Reade, Toronto, Secretary-Treasurer; Dr. Mark G. McElhinney, Ottawa; Dr. A. J.

McDonagh, Toronto; Dr. F. T. Coghlan, Guelph; Dr. F. E. Bennett, St. Thomas; Dr. R. G. McLaughlin, Toronto; Dr. Geo. Parker, Guelph; Dr. A. A. Smith, Cornwall; Dr. J. A. Bothwell, Stratford; Dr. W. J. Bruce, Kincardine; Dr. Oliver Martin, Ottawa; Dr. A. E. Ahrens, Stratford; Dr. W. C. Gowan, Peterborough.

Elgin Educational Committee—Dr. F. E. Bennett, St. Thomas, Chairman; Dr. H. H. Way, St. Thomas, Secretary; Dr. C. C. Lumley, Dr. T. C. Trigger.

Guelph Educational Committee—Dr. Geo. Parker, Chairman; Dr. F. T. Coghlan, Secretary.

Ottawa Educational Committee—Dr. Oliver Martin, Ottawa, Chairman; Dr. M. G. McElhinney, Ottawa, Secretary; Dr. L. E. Stanley, Dr. C. H. Juvet, Dr. W. C. McCartney, Dr. W. R. Greene, Dr. J. J. Lacey, Dr. A. F. McCordick.

Peterborough Educational Committee—Dr. W. C. Gowan, Peterborough, Chairman; Dr. W. T. Holloway, Peterborough, Secretary; Dr. Middleton.

Stratford Educational Committee.—Dr. A. E. Ahrens, Stratford, Chairman; Dr. J. A. Bothwell, Stratford, Secretary; Dr. S. B. Gray.

Toronto Educational Committee—Dr. R. G. McLaughlin, Chairman; Dr. Horace Eaton, Treasurer; Dr. C. A. Kennedy, Secretary; Dr. F. J. Conboy, Dr. W. H. Doherty, Dr. E. W. Paul, Dr. T. N. McGill, Dr. G. M. Sutherland, Dr. R. J. Reade, Dr. A. E. Webster, Dr. Wallace Seccombe.

REPORT OF THE ONTARIO DENTAL EDUCATIONAL COMMITTEE.

To the Members of the

Ontario Dental Society:

At the last meeting of the Ontario Dental Society, held June, 1910, the following Educational Committee was appointed: Drs. Wallace Seccombe, Toronto; A. J. McDonagh, Toronto; Mark G. McElhinney, Ottawa; A. A. Smith, Cornwall; J. A. Bothwell, Stratford; F. T. Coghlan, Guelph; W. J. Bruce, Kincardine; R. J. Reade, Toronto, and W. C. Gowan, Peterborough.

The Committee beg leave to present the following report of their work:

Dr. Wallace Seccombe was re-elected

Chairman, and Dr. R. J. Reade, Secretary-Treasurer. There were nine meetings held during the year.

The educational work was carried on throughout the Province by the appointment of sub-committees. The local Societies throughout Ontario were asked to nominate a committee to take charge of dental educational matters in their district. The committees so nominated were to be appointed as sub-committees to the general Educational Committee.

In order to bring these different committees in touch with the Executive Committee it was decided that the chairman of all local committees appointed by the Educational Committee of the Ontario Dental Society be ex-officio members of the Executive of the Provincial Committee.

There were sub-committees appointed from the Elgin Dental Society, Toronto Dental Society, Ottawa Dental Society, Stratford Dental Society, Peterborough Dental Society, and Guelph Dental Society. The officers of these different Societies will be found in the report before you now.

Your Committee received a suggestion from Dr. W. E. Ogden, of the staff of the Sanitarium at Gravenhurst, to have a dentist appointed on the medical staff. The question was considered by your Committee and the possibility of such an appointment discussed. Mr. W. J. Gage, who to a great extent manages the finances of the institution, was seen regarding the matter. He expressed his appreciation of the condition, and intimated that in the re-arrangement of the finances of the institution this question of dental treatment would receive one of the first considerations.

During the year the Committee needed financial assistance to carry on the work successfully. There was a suggestion that the Canadian Oral Prophylactic Association should supply the Ontario Dental Educational Committee with funds to cover expenses of Educational work. The question of the amount of funds and the relation that the Canadian Oral Prophylactic Association would bear to the Ontario Dental Educational Committee was briefly discussed. It was arranged that the Executives of the two associations should meet and dis-

cuss the subject. As a result of the meeting it was agreed that the best interests of educational work would be served if there was but one central body to which all inquiries and requests for assistance should be addressed. This was to prevent confusion as to the method of campaign, and also to prevent overlapping of financial assistance. On the foregoing understanding it was decided to ask the Canadian Prophylactic Association for the sum of \$75.

In the different parts of Ontario lectures were being delivered to nurses in training. It was thought that a great good would result if the lectures were as uniform as the individuality of the lecturers would allow. Therefore, Dr. R. G. McLaughlin undertook to prepare an outline of lectures to the nurses in training. These were printed and sent to the different sub-committees throughout the Province.

Your Committee during the past year has collected a number of lantern slides and charts, for the purpose of making the lectures more intelligible to the audience. These lantern slides are for the use of the lecturers throughout the Province of Ontario.

Since our last report the Ontario Department of Agriculture has issued the pamphlet prepared by your Committee, entitled, "The Teeth and Their Care," and known as Bulletin No. 181. Forty thousand copies were printed, and have been widely distributed, every dentist in Ontario receiving a number of copies to give to his patients.

At the present time your Committee also have on hand the preparation of another pamphlet to be published by the Ontario Department of Agriculture. The draft of this pamphlet on "Prevention and Decay of the Teeth," is being prepared by Dr. A. A. Stewart.

A letter was sent to the Board of Directors of the Royal College of Dental Surgeons at its last annual meeting in May, 1911, placing before the directors a short account of the work accomplished by your Committee. The Board considered it advisable to help on the work and acknowledge the Committee by donating to it the sum of \$100. This support will be of great advantage. This Committee begs to suggest

that the Ontario Dental Society donate a like sum.

Regarding the appointment of this Committee: In view of the great importance of the work of this Committee, your Committee begs to suggest that its appointment be undertaken only after careful consideration by this convention, and recommends that the Committee be composed of the chairman of each local Educational Committee and five members of the O.D.S. residing in such proximity to one another that they may conveniently meet from time to time. These five, in addition to the foregoing, to be the Executive of the Educational Committee.

The subjoined reports of the various committees show the important work being carried on in Ontario by means of the Ontario Dental Society.

In the various hospitals the nurses in training are receiving lectures. This is a very fruitful source of spreading knowledge among the people, as the nurses go into many homes throughout the Province.

In the Normal Schools lectures have been delivered to the teachers in training. This also is a very important feature of the educational work, as those teachers impart the knowledge to the pupils.

With regard to dental inspection of schools, more work has been accomplished along these lines than last year. The results of these examinations show an unsatisfactory and serious condition menacing the health of the children.

The showing of these examinations will have two very important effects, first, the appointment of School Dental Inspectors, and, secondly, the establishment of free Dental Clinics for the poor, maintained by the Government.

Complaint has been made to your Committee that some dentists to whom children have been sent by school nurses have sent the children away, ignoring entirely the necessity for the work. Your Committee recommends that dentists who do not wish to work for children, or who are too busy to work for them, should refer such patients to some other practitioner who would undertake this very important work.

Your Committee feel much encouraged

with the results of the work of the past year. The people seem quite ready to approve of the efforts being made on their behalf. Also those in authority seem ready to help the cause of dental education and to attend to the wants of the needy.

And we feel that conditions are such that the Educational Committee will be able to accomplish much for the people during the coming year.

All of which is respectfully submitted.

WALLACE SECCOMBE,

Chairman.

ROBERT J. READE,

Secretary.

Toronto, May 31, 1911.

The President,—Gentlemen: It must be a great pleasure to this Society to know we have this important Committee taking up this important work in such an energetic manner. The portion relating to the formation of this Committee and the changing of the method of the appointing of it is a matter for discussion. There has been another suggestion made in regard to that which was before the Executive Committee of the Society, and before we decide on making the change I think we should hear from them.

Dr. McDonagh—Mr. President and Gentlemen: This is from the Educational Committee of the Canadian Dental Association, and the President of the Canadian Dental Association suggested to the Executive, or rather suggested to the Society, and it was brought up at the Executive last night and approved of by the Executive and sent on to be considered by the Society. I will read over the suggestions and the changes that were made in this draft last night. Suggestions for the formation in each Province of a General Committee of Dental Surgeons to be called the "Educational Committee of that Province."

I.

The Educational Committee shall consist of:—

(A) The President of the Official Board or Council of the Province, and two members of the same, nominated by the President and elected by the said Board or Council.

(B) The President of the Provincial Society, and two members of the same, nominated by the President and elected by the Society.

(C) The President of the Canadian Oral Prophylactic Association, Limited, or his delegate, and two dentists, residents of the Province, nominated by the President and elected by the Association.

(D) The largest Society in any city, town or district, or any Society having a paid membership of at least twenty members, shall have the privilege of appointing one representative, preferably the President of the Society or the Chairman of its Educational Committee.

II.

The Educational Committee shall be deemed ready to operate as soon as any two of the above named organizations shall have appointed their representatives.

III.

(A) Each representative on an Educational Committee shall be a resident of the district in which the Society by which he is elected, has jurisdiction.

(B) If in the opinion of the President of any of these bodies, any representative from his Society fails to perform his duties, on the General Committee, it shall be the duty of the said President to appoint a substitute in place of the defaulting member, to act until the next meeting of his Society, when a permanent representative shall be appointed, as above ordered.

IV.

Members of the Educational Committee shall hold office for one year, or until their successors are appointed.

V.

The officers of the Educational Committee shall consist of:—a President, a Vice-President, and a Secretary-Treasurer, to be elected at the first meeting. Elections shall be held annually thereafter, the date to be fixed by the Committee.

VI.

The financial year for the Educational Committee shall end on the thirty-first day of December.

VII.

No accounts shall be paid by the Secretary-Treasurer until passed by the Committee.

VIII.

It shall be the duty of the Educational Committee,

(A) To censor all articles published, or acts performed for the Dental Education of the Public.

(B) To advise with all organizations represented on the Committee, concerning their plans and methods of work.

(C) To endeavor to have public lectures given to nurses, teachers' associations and the public generally, also to have articles published either in pamphlet form or in the press for the education of the people, and to assist in any movement for the elevation of the Dental profession.

(D) To be responsible for the preservation of charts, slides, and any other material used in these lectures, and to use them to the best possible advantage.

IX.

It shall also be the duty of the Secretary-Treasurer of the Educational Committee, when possible, to furnish the Canadian Oral Prophylactic Association with a statement of the work to be undertaken and its estimated cost, so that the said Association may be able to arrange a proper distribution of its funds.

X.

The Secretary-Treasurer of the Educational Committee shall present to the Committee a report of the work accomplished during the year, and an audited financial statement. A copy of the said report and statement shall be forwarded to the President of each organization represented on the Committee, who shall present the same to his organization.

Dr. Cavanagh:—There seems to be some difference of opinion in regard to the formation of this Committee. Both of those gentlemen have presented us with very good reports, but neither one of them has given any reasons why the report of either should be adopted. Dr. Reade has read an extensive report, a very good one, and Dr. McDonagh has read another one. I would like the gentlemen or someone representing them to give us the reasons why this formation of the committee in their opinion should be the one adopted, or what the cause is for changing the resolution brought in by the Resolution Committee.

PRELIMINARY AND PROFESSIONAL EDUCATIONAL REQUIREMENTS OF THE PROVINCIAL DENTAL BOARD OF NOVA SCOTIA.

(Continued from page 401, August issue.)

II—TERMS OF STUDENTSHIP.

The term of studentship for the practice of Dentistry in Nova Scotia shall be four regular winter sessions, in a recognized Dental College, the curriculum of which requires four Academic years of studentship before graduation, which shall aggregate a minimum of thirty months actual attendance before receiving a Diploma.

III—For a person who is a graduate of a Dental College recognized by the Provincial Dental Board which requires less time than four years, and thirty months attendance, the term of studentship shall be thirty-six months. The extra time over and above the months in College shall be spent in bona fide studentship under a registered Dental Practitioner in Canada, in which case the student shall file a certified copy of his contract with his preceptor in the office of the Secretary Registrar of the Provincial Dental Board of Nova Scotia, or he may take the final year in a recognized Canadian Dental College. Upon receiving his diploma he will be eligible for examination under the regulations of the Dental Board.

IV—Professional examinations shall be held twice during the year, in April and September respectively.

V—In all examinations the pass mark shall be fifty per cent. in each subject; provided that in case of failure the candidate who obtains fifty per cent. in any subject, or subjects, will, on re-examination be exempted in such subject or subjects, but will be required to obtain sixty per cent in each of the remaining subjects.

VI—No candidate shall be admissible to examination who has been rejected in the subjects of the examination by any other licensing Board within the three preceding months.

VII—Applicants for admission to the examinations are required to lodge with the Secretary Registrar a schedule (forms of which will be supplied) showing the courses

they have attended, qualifying for admission.

VIII—All candidates for registration in Nova Scotia must take the prescribed professional examination, subject to the rules and regulations of the Dental Board, provided that students of the Maritime Dental College of Halifax who pass the sessional and Final examinations held by the Faculty of Dentistry of Dalhousie University, and who have received a Diploma, will be exempted from the Professional examination of the Provincial Board, and if all other requirements of the Dental Board are fulfilled, the candidates shall receive a certificate of Registration to practice Dentistry in Nova Scotia.

The Dental Board shall accept persons holding the certificate of Qualification of the Dominion Dental Council of Canada, for registration without examination providing that all other qualifications imposed by the Board are met (Chapter 42, Acts 1907).*

These professional requirements for registration shall come into force and apply to all candidates on and after March 15, 1910, Provided: that persons who are registered as Dental Students in Nova Scotia and have begun their College Course before the approval of these regulations by the Governor-in-Council, shall be exempted from the professional examinations. (Cap. 105, R.S. 1900 Sect. 11).

All previous regulations relating to Matriculation and Registration are hereby rescinded.

*Any Candidate for registration as a practicing Dentist in Nova Scotia who produces to the Secretary Registrar satisfactory certificates of having passed in some Dental College or University recognized by the Dominion Dental Council of Canada in the following subjects may be exempted from further examination upon such subjects. Anatomy, Chemistry, Biology, Physics, Histology, Physiology.

Obituary

Dr. M.C. Clarke, for over thirty years a prominent citizen of Winnipeg, passed away quite recently. His death was preceded by a severe illness of two months' duration. Dr. Clarke was probably the most prominent rifle shot in the city, and it was he who founded the Manitoba Rifle Association. He was also one of the foremost hunters in western Canada.

The late Dr. Clarke was born in Summerside, Prince Edward Island, in 1848. He received his education in Summerside and in Boston, Mass. After his graduation from a college of dentistry, he practiced for a time in Nova Scotia, and later in Boston. From this city he came to Winnipeg in 1880, from which time he carried on a large dentistry practice until a few months ago, when ill health forced him to retire.

The late doctor organized the Manitoba Rifle Association, and was one of its foremost members until two or three years ago when he resigned to take a commission in the 16th Field ambulance. Until this year he was never absent from the rifle ranges, and almost every year he went to Rockcliffe as a member of the Manitoba team.

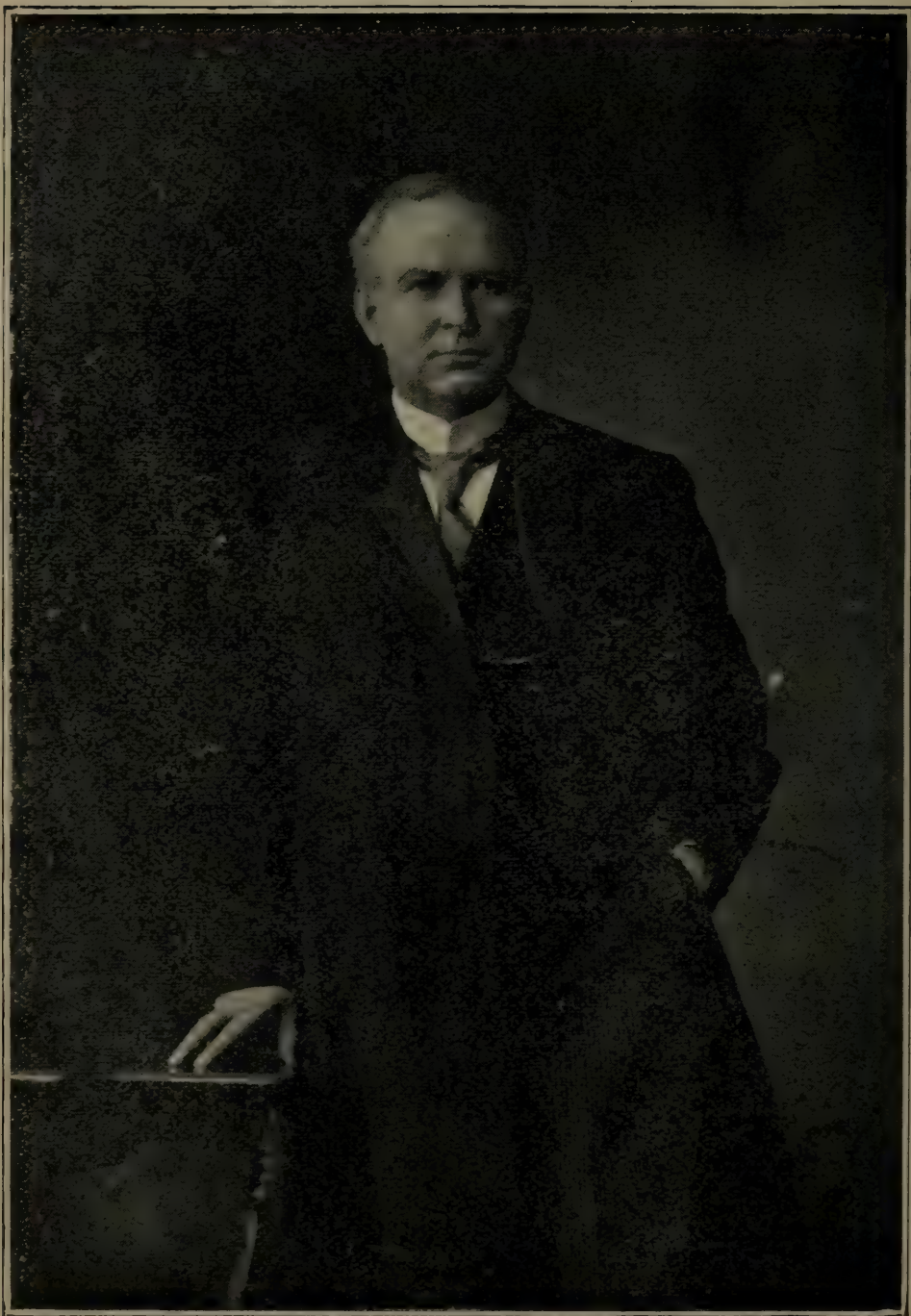
Was Keen Hunter.

Dr. Clarke was a keen moose hunter, and was one of the very first in Manitoba to hunt wild geese. Many hunters of wild geese owe their skill to his instruction.

The illness which terminated fatally Wednesday resulted from a sickness ten years ago, from which he never fully recovered. About February 1, his health failed noticeably, and in the latter part of March he went hunting in the hope of improving it. As a result of this exertion, symptoms of heart trouble became evident. Early in April a consultation was held and it was found that he was suffering from a complication of diseases. For two or three days before death came he had been in a semi-conscious condition, and he passed away peacefully at 11 o'clock last evening.

Marksman and Curler.

Back in the 90's there was no better known curler in Winnipeg than M.C. Clarke. He was a pioneer member of the Thistle Curling Club, and was Bob Dunbar's first skip in that club. His rink was a famous one in those days, being composed of M.C. Clarke, with R. H. Dunbar, L.R. McKenzie and W. A. Carson, accompanying members. This rink was always near the front in the first Winnipeg bonspiels. Later he was a member of the Granite Club, where he was always considered one of the star skips. C. D. Stovel and J. C. Macdonald were prominent members of his rink in the Granites and Grand Challenge winners at Winnipeg bonspiel. Of recent years the doctor had been compelled to retire from the game owing to rheumatism.



J. H. IRWIN, D.D.S., L.D.S.
Collingwood, Ont.

President Ontario Dental Society, 1910-1911

Dominion Dental Journal

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No. 12

Original Communications

THE RESTORATION OF THE NORMAL OCCLUDING SURFACES OF THE TEETH.

BY J. LOWE YOUNG, NEW YORK CITY.

Read before the Toronto Dental Society, December 11, 1911

Normal occlusion of the teeth is not a new idea, but previous to the writings of Dr. Edward H. Angle on the correction of malocclusion, the necessity of restoring normal occlusion as a result of orthodontic treatment was not known by the dental profession. This was the thought which was the basis of the classification and diagnosis of malocclusion and which immediately placed orthodontia upon a scientific foundation, enabling it to advance with such rapid strides during the last ten years.

Now, in order for the orthodontist to correct malocclusion, he must of necessity have a clear and definite understanding of this ideal condition which he is attempting to restore. Thus it is that normal occlusion is the one supreme picture which the orthodontist has in his mind, the beginning and the end of his anticipations of treatment, the guide which governs the daily progress of correction of malocclusion, the standard in occlusal relations which, above all, it is desirable to obtain.

Examined analytically, this condition of normal occlusion exhibits first, normal structure of the teeth, collectively and individually, and second, normal function of the teeth, collectively and individually. Normal structure of the teeth will imply the perfection of form of the individual teeth and of each dental arch. Normal function will imply the normal occlusal relations of the inclined planes of the cusps of the individual teeth.

With this conception of normal occlusion it will be apparent that the loss of one tooth or even one cusp of one tooth, will to just that degree destroy both normal structure and function.

Did it ever occur to you that the orthodontist often works for years to build up this normal occlusion, only to have it pulled down

in a day by the ruthless extraction of a single tooth, or by the lack of restoration by the general practitioner of cusp contour or approximal contact in making fillings or inlays?

It would seem, therefore, that the dentist must share the responsibility of the orthodontist in emphasizing the importance of normal occlusion by preserving it at all times, and at least by not destroying it.

Hence, if the general practitioner is to properly restore any part of the dental apparatus, he, like the orthodontist, must have in his mind's eye the forms, surfaces and positions of the dental organs when normal.

The value of proximate contact, the proper occlusion of each cusp, the depth of each fossa, the proper inclination of each incline plane, the size and direction of the minutest ridge, or even the fine marking of a sulcus, ought to be known to him who aspires to restore or recreate these anatomical forms.

In this brief paper it is my purpose to call your attention especially to the one phase of normal occlusion represented in the relations of the occluding, or morsal surfaces of the teeth of one dental arch to the same surfaces of the teeth of the opposing arch.

At the same time I wish to appeal to you to use the same standard of normal occlusion as a guide in your work that the orthodontist uses, so that when you examine a set of plaster models made from accurate plaster impressions, you will not only consider the teeth of one arch in their mesio-distal and bucco-lingual relation to those of the opposing arch, but that you will note the position of each cusp of each tooth and its relation to the cusps of the teeth of the opposing arch. For, when carefully considered and thoroughly understood, their proper reproduction becomes of the utmost importance to the general practitioner, and the prosthodontist, as well as to the orthodontist.

It is my further purpose to direct your particular attention to the sulci, the fossae, the ridges and the inclines found on the occluding surfaces of the teeth, and to consider the possibilities of their reproduction in your work. These features can be best studied from the natural skull wherever it is possible to procure one, having all the teeth in normal occlusion, but in the absence of such, great benefit may be derived by careful consideration of plaster models made from accurate plaster impressions such as the orthodontist is in the habit of making.

By means of these models, the relation of the cusps, inclines, fossae and sulci of the occluding surfaces of the teeth of one arch to the same surfaces of the teeth of the opposing arch can be studied from the buccal, lingual and occlusal view.

My object, therefore, in bringing this phase of occlusion to your attention, has a more definite purpose than the subject as it is related to the work of the orthodontist, and yet it is of vital importance to him because it bears such an important relation to his most

difficult problem, namely, the retention of teeth that have been in malocclusion. For often the result of several years of most painstaking efforts of the orthodontist are thwarted by improper fillings. It therefore appears that if in any way we can help each other in this most difficult problem we should try to do it by working in harmony.

In this respect it is encouraging to note that through the work of Dr. G. V. Black, one phase of this problem, viz., the restoration of the mesio-distal diameters of the teeth reproducing the proximate contact points by properly shaped and contoured fillings and inlays, is being quite generally solved.

For many years I have been impressed with the lack of efficiency of the masticating apparatus due to fillings reproducing only portions of the occluding surfaces of the teeth. This lack of efficiency is due also, in a very large measure, to the lack of reproducing the sulci and fossae as they are found in the natural teeth.

That it is nature's plan to have cusps of a proper length, and fossae of a proper depth, and sulci of a certain form, and ridges of definite shape in order to make the dental apparatus efficient, a careful study of these occlusal surfaces in the natural state will show conclusive proof.

Here let us note that the bottom of the sulci when normal are never reached by the cusps of the teeth of the opposing jaw. In this respect the old-fashioned mill stones were patterned after the grinding surfaces of the teeth, and whenever the miller allowed the stones to become dull, so that the sulci were very much reduced in depth, though not entirely obliterated, the grist was invariably spoiled. In like manner, whenever the dentist fails to reproduce the sulci and fossae in restoring lost portions of the grinding surfaces of the dental organs, does he interfere with their efficiency for masticating food.

Now, with this idea of the normal occlusal surface in mind, let us, by way of contrast, consider the meager, inefficient manner in which the average practitioner attempts to reproduce them, and see how far short he falls from the ideal in this respect.

A case that has been under my observation for a number of years for orthodontic work, and of which I have several sets of models, impressed upon me the probable mutual benefit of discussing this subject with you.

By studying the models of this case you will see by examining and comparing the occluding surfaces of the teeth before and after the inlays were inserted, how lacking are the sulci and fossae in these otherwise beautiful inlays. You will observe almost flat surfaces and in many cases over-contour. In several places the cusp of a tooth in one jaw strikes too hard on the inlay in the opposing

jaw. Indeed, it is a wonder that more teeth are not split where fillings and inlays are left in such a condition.

These inlays were made by as conscientious an operator as I have ever known. I am satisfied that he would do just such work as this for his own child and feel proud of it. The child complained of not being able to masticate food as well as she formerly could.

Now, the question then naturally arises, how shall these sulci and fossae be reproduced? Never having made a cast gold inlay I am not very familiar with the technique, but I understand there are two methods employed in this work, namely, the direct, and the impression method, but in either case the occluding surface of the inlay should be made to represent the natural shape of the tooth that it is to occupy before it is cemented in place. I have seen enough of this work done to know that it is not a very difficult matter to reproduce these fissures and pits in wax. I am also quite well aware that if the sprue wire is placed in that portion of the wax in which the sulci have been reproduced when the cast is made some of the sulci are obliterated. Therefore, it is advisable to have the sprue wire as small as is practical so as to obliterate as few of the sulci as possible.

Furthermore, after the cast is made the sulci and fossae will be found somewhat rough. If an attempt be made to smooth up these sulci with a plug finishing burr or stone of any description, the result will be grooves with a round bottom rather than sharp sulci as found in the natural teeth. No doubt some of you will say that in the majority of cases requiring inlays the sulci are not as well defined as the case shown, owing to the wearing down of the teeth, but I wish you to note that the bottoms of the sulci do not disappear until the tooth is worn down beyond them, which very seldom occurs.

These sulci and fossae can be smoothed up, or entirely cut in the inlay with a suitable shaped steel engraver. In order to do this the inlay must be firmly held and at the same time so protected that the thin edges will not be marred so as to prevent it fitting into the cavity.

Thus where the impression method is employed it is an easy matter to fasten the metal die with engravers' wax, to a suitable handle.

In doing this a glass of ice water should be at hand so as to chill the wax as soon as possible and thus prevent the mercury being driven out of the amalgam with the heat of the wax. After drying off the metal die a little sticky wax is heated and dropped into the cavity, the inlay warmed and pressed to place, and allowed to cool.

In this way the inlay is so held that it is possible to smooth and polish the sulci and fossae if they have been properly reproduced in the wax, and if not, they should be cut in the inlay. Steel engravers of various shapes should be used in doing this, for by their use sharp sulci such as are found in the natural teeth, can be

cut in the gold, and if properly done, these sulci will require very little burnishing to make them perfectly smooth. The inlay is then warmed so as to remove it from the metal die and the wax is cleaned off with chloroform.

Where the direct method is used, the inlay can be fastened direct with Bottom wax, care being exerted to have all thin edges of gold well supported with wax so that the shape of the inlay will not be changed by using the steel engraver.

There is no doubt that it is more difficult to properly reproduce the sulci where the inlay alone is mounted in the wax than where it is set in a metal die of the tooth. But with a little care in either case it is possible to reproduce these sulci.

The inlays that will now be shown were made by request, in duplicate by some well known operators. It is not the intention to criticize these, other than where they are deficient on the occluding surface. The first inlay of each case was finished by the operator who made it, as if he were going to cement it in the tooth. The second one was left as it was cast. These have been treated as described above so that you may compare them.

In some of these you will observe that it was necessary to add to them with gold solder so that the ridges and sulci could be reproduced to conform to the anatomy of the teeth.

The full bicuspidis were carved by a laboratory man, and are his first attempt at such work. By comparing them with the plaster models that were given to copy, it will be seen how possible it is to reproduce the anatomical shape.

One of the great difficulties experienced by the orthodontist is to retain the mesio-distal relation after it has been established. Very frequently this trouble is due to improper fillings on the occluding surfaces of the teeth, particularly those of the lower first molars. If these fillings can be made to accurately reproduce the original shapes, especially the occluding surfaces, of these teeth, the orthodontist will experience much less difficulty in the retention of these cases.

Granting, then, that these occlusal restorations are possible, does it not appeal to you that they are necessary from the standpoint of beauty, perfection of anatomical contour and especially of efficiency of the masticatory apparatus?

In presenting to you the keen appreciation by the orthodontist, of the importance of normal occlusion, it is with the hope of arousing a like appreciation in the dentist, so that in all his efforts at restoration of the lost parts of the dental apparatus he will be inspired to accurately reproduce in the minutest detail, their anatomical shape. If I have succeeded in doing this I shall feel well repaid and will look forward with keen interest to a heartier co-operation between the dentist and the orthodontist in the attainment of normal occlusion.

FACIAL NEURALGIA.

M. A. ROSS THOMAS, D.D.S., LONDON, ONT.

Read before the Ontario Dental Society.

Neuralgia is not a disease in itself, but rather a manifestation of a disease or perverted function. It may be defined as a severe paroxysmal pain in the area of the distribution of a nerve or along its course, and is not accompanied by fever. According to Barret, true neuralgia is principally confined to afferent nerves, but it may be of a reflex character, and hence have its origin in efferent nerves. (Buckley.) The neuralgies that the dentist has to deal with are principally confined to the fifth cranial and are known as facial, trifacial or trigeminal neuralgia, and take in pains arising in or reflected to the teeth.

Marshall states that "The conditions that bring about neuralgia are many and varied and consist chiefly of diseases which lower the vital power of the system, such as anæmia, or those which interfere with the functions of circulation, respiration, digestion, assimilation, secretion, elimination; the presence in the system of abnormal substances, as in gout, rheumatism, diabetes, malaria, nephritis, chronic pyæmia, syphilis and metallic poisoning; local conditions which cause reflex peripheral irritation, such as diseases of the teeth, eyes, ears, stomach, uterus and ovaries; chronic inflammation of the nerve or its sheath; pressure from abnormal growths within the bony canal through which the nerve trunk passes, or pressure from tumors and localized anæmia or congestion of nerves or nerve centres. Neuralgia may, therefore, be the result of an actual diseased condition of the nerve, as, for instance, in neuritis, or it may exist with no discernable structural change in the nerve tissue or in the nerve centre."

Women are more subject to neuralgias than men, particularly during the so-called change of life. It is seldom found in persons under the age of twenty, although no period of life is exempt, and as the disease becomes chronic patients have suffered from it until the close of a long life. In most cases that are of obscure origin that present themselves a history of hereditary tendency is given. Climatic conditions have a great deal to do with the trouble, it being worse in cold, damp weather and in the extreme humid atmosphere. Many patients have annual attacks and can almost name the day of their return. Although the sense of taste is carried along the fifth nerve, yet, strange to say, it is never impaired during an attack.

Some of the many conditions in and around the teeth which cause neuralgia may here be enumerated:

1. Pulpitis.
2. Pulp nodules, partly calcified pulps, secondary dentin.
3. Pericementitis.

4. Cementosis.
5. Deposits on the roots of teeth.
6. Exposed dentin and cementum.
7. Impacted teeth.
8. Faulty occlusion.
9. Exposure of pulp at the bifurcation of roots.
10. Faulty root fillings, broken broaches, etc.
11. Faulty fillings and crowns.
12. Antrum trouble.

The main thing in the treatment of neuralgias connected with the teeth is to locate the cause, and no amount of trouble and time spent by the dentist in an effort to relieve these very distressing pains is ever wasted. (Harlan.) It is very often necessary to give drugs to allay the pain while every means is exhausted to locate the trouble for a correct diagnosis is most essential. The use of the skiagraph will show us the faulty root fillings, broken broaches in roots or ill-fitting bands on crowns, etc.

The treatment of neuralgia depends largely upon the cause as to whether it be medicinal or surgical.

The medicinal treatment may be divided into local and general.

The local treatment may consist of drugs which act favorably on the sensory nerve endings, giving temporary relief. Dr. Buckley's dental liniment is highly recommended and is composed of:

Rx	Mentholis	grs. xxx
	Alcoholis	
	Etheris	a.a. 3 vi
	Chloroformi	3 iii

Sig:

Apply by vigorous rubbing over the area of distribution of nerve and affected part.

or

Rx	Camphoræ (gum)	3 ii
	Tincturæ aconiti	3 i
	Linimen'ti saponis	3 iii

Sig: as above.

W. H. Truman recommends the following:

Rx	Camphoræ (gum)	3 i
	Etheris	3 ii
	Alcoholis	3 i
	Chloroformi	3 iii

Sig: as above.

Applications of from one to three millampers for two to five minutes from the positive electrode of a galvanic battery is often of value. (Marshall.)

The general treatment, which involves the administration of drugs, such as quinine, mercury, iodide, iodides and iron for malaria, syphilis and anæmic conditions, should in most cases be

referred to the family physician, for better results to the patient will as a rule follow when physician and dentist work in harmony. Have we not all seen cases where a medical practitioner has treated a patient for months for a condition which the dentist is able to correct in a few hours or even minutes, and *vice versa*. It is the plain duty of every dentist to prescribe drugs for the temporary relief of pain, such as acetanalid, phenacatine, caffeine and anti-pyrine, and sometimes, when these fail you, it is well to give your patient a dose of morphine (but not prescribe it). Dr. Buckley suggests that we keep 1-8 gr. tablets and give them to our patients as the case indicates, rather than prescribe and run the chance of the patient having the prescription refilled and so getting the habit.

Butyl-chloral hydrate is supposed to have a direct action on the fifth nerve, producing sleep.

Everything that will tend to build up the patient's physical condition, proper food, clothing, regular rest and healthy thoughts and freedom from worries of all kinds, should be insisted upon.

It is often advisable to recommend the official syrup of iron, quinine and strychnine as a general tonic.

We are seldom called upon to treat that most dreaded form of neuralgia known as tic douloureux, but sometimes we may aid in its correct diagnosis. It is one of the forms of pain for which little can be done, either medicinally or surgically, and elicits our greatest sympathy. Hirt sums it up very properly when he says, "Numerous are the means at our command for combatting tic douloureux, and quite as numerous are the patients who after hundreds of unsuccessful trials have given up in despair all medicines and all physicians."

DISCUSSION.

DR. COPELAND.—I have not much to say in the discussion of this paper. I think first I would like to congratulate the members of the committee on arranging these little talks on subjects that are so important in everyday practice.

In the matter of neuralgia, I may say that I consented to discuss this paper with the idea not of giving much help, but touching upon some points that have been difficult with myself and trying probably to get from the discussion by others some help for them. In connection with neuralgia, often we meet with cases where we find a severe pain probably in the upper jaw and probably in the proximity of the first or second bicuspid, and on examining the tooth very carefully we find nothing that seems to cause it. Frequently we find a lower molar with a cavity, and by relieving that we will free the patient from those neuralgic pains that he has had.

Again, often after carefully examining the teeth of your patient who has been suffering from severe neuralgic pain we find no cavity and we find an inflamed gum margin around the molar, and prob-

ably find a bristle of a tooth brush or a piece of wooden tooth pick, and after removing that I myself have just painted it over with iodine-aconite. I was wondering if any other dentists had found anything that would help that condition and bring relief any sooner. Then there is also the pain that is found very frequently from a non-erupted third molar as it is in eruption. I would like to find something that would help the patient. Personally I use the same, aconite and iodine, for local application, and I prescribe quinine, and I have found very helpful a poultice of antiphlogistine to be applied during the night, because I think we all admit that at this time it is very painful.

DR. FOSSUME.—There is one point which has not been mentioned which I would like to speak about, because I have had some cases in my own practice where I have solved the origin of the pain in the patient's head, a pain known as purulent neuralgia, and there have been cases of infected areas about the root ends of teeth that have been devitalized and the roots filled. There were abscesses of many years' standing, there were blind abscesses; the teeth were not particularly sore and they had been filled for so many years that it was impossible to get the history of either of these cases I am mentioning now—I have three in my mind—but, inasmuch as the suffering was considerable and more or less continuous and the patient always in despair, they came to me as a last resort, in some instances sent by the physician. One was a case I met on the street. I asked him, "How are you?" He said, "My life is miserable; I have pain in the back of my head all the time." I found he had pain in the occipital region, in the right side. I said, "Come in and let me look at your teeth. How long have you had it?" "Six weeks." When I examined his teeth all the crowns were good, there were no cavities, no pyorrhea, nothing wrong. I said, "I see nothing wrong, but I want you to go and have a skiagraph taken of both the upper and lower ridges of the roots on the right side. This was done. The first molar on the right upper side was found to have a large abscess cavity about the roots, extending over a large area. I advised him to immediately submit to an operation. He said he would. When I cut through the thin mucous membrane covering the buccal roots the lance plunged immediately into the abscessed cavity and there was a rather small perforation, as large as the largest round bur we use. It plunged right through this little perforation. I took the large long-shank engine bur I use for this purpose, cut it open, and found an abscess cavity in the jaw about the size of a hazel nut. There was no pus. It was filled more or less with granulations, like so many of these cavities are. They are not true abscess cavities, they are simply absorptions of the alveolar process of long standing and lying in the pyogenic membrane. They are very sensitive. When I had opened the cavity large enough I took the large spoon I have for this purpose, bayonet shaped, and scraped the entire cavity, cleaned the pyogenic membrane to get a clean bony surface;

this was dressed twice and then I used Dr. Beck's bismuth paste. This was injected into the cavity. After the operation he had a little pain in his head, but the third day after all the neuralgia had ceased. Two other similar cases presented themselves. One man was a Westerner; he came to New York for relief from neuralgia; on the right side the second molar was involved; it was a very small abscess cavity about the posterior buccal root of the molar, which was disclosed by the skiagraph. This was also opened and curetted and he was free from pain. The third case was one of neuralgia on the right side. The second lower bicuspid was involved. A skiagraph was taken, but no abscess cavity was disclosed in any part of the mouth by the skiagraph. I was very much perplexed. However, I opened the second bicuspid and found it was dead and the root pretty well filled. It was thoroughly sterilized, but no relief. I decided there must be a small abscess cavity underneath the root or the pyogenic membrane, with bone absorption at the end of the root. A large opening was made and, as I had thought, there was a small abscess cavity there, and when this was thoroughly curetted, which took some time, all pain ceased.

I positively believe, gentlemen, a great many of what are called facial neuralgias, where there are no external eruptions that are visible, are due to these blind bony absorptions or cavities about the ends of dead teeth. (Applause.)

DR. THOMAS.—I am very glad Dr. Fossum has raised this point. I have had a number of cases of a similar character myself in my own practice, and I read over different works on surgery and medicine, quite a number of them, in preparing this paper, and in no case in a work devoted to general surgery did I find any case where the teeth were considered to be a general cause of neuralgia. There were in most cases just a casual mention of the fact that teeth were sometimes the cause, and in no case did it give any specific instance. In some of the works it read it didn't even mention them at all as being the cause of neuralgia, and I know every man in this room has had similar cases. I feel we do not get quite the credit that is due us in the treatment of these cases, and I know physicians generally do not give us a fair chance in consultation.

DR. COPELAND.—Might I state a case that has come to mind because of this discussion? I have a patient who came to me who had quite a severe swelling over the region of the first molar. He went to a physician first and then came to me. We examined all his teeth in that region, and he has splendid teeth, but one filling, and all his teeth in perfect condition seemingly, and we decided to try for antrum trouble and everything we could along the region, and when the abscess broke we passed a probe up through the sinus and found healthy tissue there. There didn't seem to be any cause upon the surface, no indication of antrum trouble. I drilled up into the fossa of the two molars to see if those teeth might be dead. After testing in every other way and finding the living pulps, I am

still at a loss to know the cause of the formation of that abscess. I was wondering if any of the other dentists had met with anything similar and what they found to be the cause.

DR. FOSSUME.—Did you have skiagraphs made?

DR. COPELAND.—No.

ARTIFICIAL DENTURES.

F. S. BELYEA, D.D.S.

Read before the New Brunswick Dental Association, July, 1911.

The human face is a stage whereon, again and again, is repeated the drama, the comedy and the tragedy of each life.

Each of the features is an actor cast for a greater or lesser part. Of these, the eyes with their brows, and the mouth, are, owing to their mobility, the star performers, all other contributing to a lesser degree to the expression of the emotions and thoughts of the prompter brain within.

Of course no face appeals to us as a face at all if any of its members are missing. A noseless face is a horror, and the little strip of black cloth we call a burglar's mask may well disguise our most intimate friend. What the loss of the lips mean, two little words suggest—hare-lip.

It is not my purpose, in this paper, to speak of the face as a whole, but to say a few words concerning the mouth, the character of which it is our duty to conserve by our operative dentistry, to correct by our orthodontia, and the form of which is committed to our keeping every time a fellow being applies to us for the restoration of lost organs by an artificial denture.

Concerning the selection of the proper colors and characteristic forms of the teeth and their arrangement, much has been written, and much of this has been sound and good, but, to judge by the character of the great bulk of teeth on sale at dental depots, written to very little purpose.

He who restores lost teeth in an artistic manner has done well, but, if he has neglected to restore the lips and face to something approaching their proper form, more than half his work has been left undone.

No one can accomplish much in this direction who does not take pains to acquaint himself with what I may be permitted to call the standard form of the human mouth.

No better way can be found of fixing this knowledge of form in the mind, than by making repeated visits to a good art museum, unless one becomes the owner of several casts from some of the masterpieces of sculpture.

Of course, as we deal almost wholly with the white race, we would select for our study largely from the Greek, which remains

the standard by which all Caucasian beauty and grace is compared or contrasted.

This has a further advantage for the student: everything about Greek sculpture is sharply defined, the curves are all graceful, but bold, the lines have a habit of ending abruptly in angles, and so result forms which impress themselves upon the memory.

If, for any reason, art museums or casts are not available, the next best thing to begin on is a copy of an illustrated catalogue of some art museum or of some such firm as Caproni, Boston.

The student will not be long in learning the reason for the application of the term "Cupid's bow" to the outline of the lips—the upper lip representing with accuracy the shape of the conventionalized weapon, and the lower lip its loosened bowstring.

A comparison of the knowledge so gained with the mouths of our patients and friends will reveal the fact that, in greater or less degree, all mouths are constructed on the same general plan, varying, of course, from the thick, flabby and nearly shapeless, to the thin lips with only a rudimentary brow.

Age, too, and habit of thought leave their mark: the corners of the mouth curve upward in merriment or drop from melancholy, the lines are hardened or distorted by malice and passion, or softened and beautified by thoughts which proceed from a pure and lofty mind—the actors cannot play one role the greater part of a lifetime without becoming specialized.

One may at this point, with profit, give some time to the examination of the Roman art. Some of the portrait busts wear faces singularly like certain citizens of this Republic, and, like the Greek, the features are boldly chiselled and easy to remember.

In all our studies of casts and features, we will make a mistake if we examine only the outline of the lips. The profile must also be considered. Even this is secondary to a view in, as we would naturally term it, cross section. Comparison and experiment will demonstrate that the difference between a wide and narrow mouth is largely determined by the varying width of the teeth at the cuspid region, and the degree of curvature of the arch—whether it narrows towards the Gothic or approaches the flat and angular.

All I have said in regard to these studies and comparisons relates to the face in a state of repose, for when the play is on and all is action, the actors forget that they are lame, and cease to limp, and age borrows the form of youth. But, on this stage from which the players never retire, the spectators must see, in the intervals between the acts, how life has dealt with them.

So also the repairs and paddings and make-up which we apply along with our artificial dentures must be made against the time when the features are at rest.

Giving advice is a delightful pastime. It must be great fun to be a preacher.

All the foregoing, however, was not so much intended as advice,

as to explain why and how I have reached certain conclusions and adopted certain methods of arranging teeth and plumpers

I tried long and faithfully the accepted form of plate—low and flat in the incisor and bicuspid region, and high and full in the cuspid and molar region. The reason for this arrangement is an anatomical one, and seems sound enough—the greatest apparent loss occurring where the canines and molars formerly existed.

Only, however, when I could command the courage to break away from this and every other theory, and decided to make of teeth and plate a framework, a padding over which the lips were to be draped—only then did I begin to make real progress.

The first step leads to securing more height and fulness over the central; the next to a moving backward of the canine plumper to the bicuspid region, and making it continuous with the molar prominence.

One trouble with the old arrangement is that no plumper could ever be made high enough at the cuspid region, without a surgical operation, to remove the line at that point for its entire length; moreover, a depression in this region, unless it degenerates into a deep line or wrinkle, is not necessarily a defect in a face; but worse than all, by no combination with any arrangement of the teeth themselves, could I ever secure with this older style a return of the bow of Cupid.

It was my custom to obtain, if possible, a photograph of my patient taken before the teeth were lost, and I still believe this to be the best possible practice, for, while our work must of necessity be full of compromises, we should, I think, strive for realism. Our individuality will, even then, often assert itself, and we will find ourselves trying to make all our patients wear some one favored arrangement of the teeth; and some of them will be lucky if they entirely escape our favorite mould and color also.

Not only did this older form of plumping or padding fail to give the proper form to the lips when viewed from full face, it "fell down," also, when the profile was examined; and was even more markedly deficient when the cross section aspect was considered.

Perhaps I can do no better at this point than to describe the first case in which I ever employed in its entirety this, to me at least, new method.

The patient was a young woman of rather full face—one in which plumpers, especially at the molar region, would ordinarily have been considered wholly unnecessary. I began with block teeth carefully selected—no result. Then I split off the cuspids to gain more freedom in arrangement—still no result. Then, if my memory serves me, I bought single gum teeth—a little better this time, but still a long way off. All this experimenting was done with teeth set on a base plate with wax.

I then decided to try a set of plain teeth, intending to have the result reproduced in a curved case.

Because all of the older tricks had failed me, I abandoned them and merely addressed myself to the task of making of porcelain and wax a framework over which the lips would fall as nearly the proper form as I understood that form to be.

I began at the median line and tried to get both the proper length of lip and the correct profile. As a result, the centrals were so arranged that when viewed from their cutting edges they stood at right angles with a line paralleling the bicuspids and molars on their respective sides, and formed with each other a slight angle breaking into the median line. Plumpers grew up to supply what had been lost by absorption when the natural centrals had been lost.

The next point of attack was at the angles of the mouth. These had to be carried high enough to give proper pitch to the arms of the bow. The result was a cuspid set without prominence at the point, and only moderate prominence at the cervix. The cuspid plumper was moved backward over the first bicuspids and finally made continuous with a molar prominence which I found was needed.

Having now the handle and tips of the bow roughly disposed of, I applied myself to the remainder of the task. This result was a lateral a little shorter than the central, depressed in its position in the arch and like the cuspid with low, thin gums. The resulting case was most gratifying both to myself and to my patient, and surprising in that while she has a comparatively short upper lip, no gums were needed—somebody lost a job of carving as a consequence.

Another thing astonished me and pleased the patient, the teeth themselves, though arranged in an unusual style, failed to look artificial when they showed in laughter or speech. This, I have learned, was not the result of mere chance, but a manifestation of a law which nature herself must respect, if she would do her best.

Not only the fulness but the length of the lip at any given point is determined by the position and length of the tooth corresponding with that point.

That the lower lip is strongly muscled no one need be told who has ever scaled tartar from or excavated cavities in the lower incisors of a sensitive patient. So strong by comparison is it that it easily dominates the upper lip, unless its upward tendency is held in check by a tooth of sufficient length and overhang to arrest and hold it in its true position.

An examination of the mouths of those who have an end-on occlusion, or protruding jaws and overlapping lower incisors will, I think, confirm my judgment, especially if the cases examined are of those who have reached or passed middle life.

This law, then, is, as I read it, that whatever arrangement of teeth and plumpers will best serve to restore the mouth, the lips and the adjacent parts to their proper form will invariably be

artistically correct—that is to say harmonious—when viewed merely as teeth.

The general arrangement which I have described as used in this first case—and which will be better understood by an examination of the case I pass around for your inspection—I have since used invariably (though not without some modifications) and with uniform, good results.

Of course the degree of success obtainable depends greatly upon the character of the face upon which the teeth and plumpers are expected to act. The hardest problems for me to solve are the thin faces, particularly if, as is apt to be the case in advancing years, the features are much wrinkled.

The most gratifying results, on the other hand, occur in those cases of so-called protruding lower jaw which, very often, is nothing more or less than an undeveloped condition of the upper maxilla.

Photographs, before and after, of such a case I showed two years ago before the Massachusetts Dental Society. At that time I thought and said that there had been marked recession of the lower jaw owing to an improved articulation. Since then I have had further experience in similar cases, one of which, though much milder, I operated upon before the Mass Society last June, and I now feel that practically all the gain came through a moving forward of the upper lip and the parts dependent upon the upper lip.

I suppose that those who follow a specialty of any sort should be slow in laying down laws, inasmuch as we are apt to be biased by our work, and so see all things from a narrowed viewpoint. I cannot, however, help thinking that, of all the group which make up the face, none can so mar or make a countenance as the mouth. Only stop to think that the deaf can read spoken words by watching the movement of the lips, and those bereft of both sight and hearing can, by placing their fingers upon the lips read the uttered thoughts of their friends. Am I, therefore, mistaken when I think, do I exaggerate when I say that the difference between a young and an old face is largely determined by the character of the mouth? Such at any rate is my opinion, and that opinion is based upon some study and comparison.

I have amused myself at times by altering the expression of the mouths of pictures in papers and magazines. I have been gladdened and encouraged more than once or twice by the opinions of friends of patients whose mouths I have tried to restore, that what I have accomplished has resulted in taking years from their ages.

At any rate I am never afraid of getting too young a mouth on any face, however old.

Regarding as I do the mouth to be one of the star performers, I prefer a good leading actor, even if badly supported, to a stage full of players all old, all deformed.

And now, gentlemen, I leave the matter in your hands to be

fully and freely discussed. Please do not feel that you have any lack of freedom in this matter of discussion. I am not deaf as our dear old friend Dr. Bonwell was, but I am nearly as impervious to criticism.

EARLY HISTORY OF DENTISTRY IN NEW BRUNSWICK

BY DR. A. F. McAVENNEY, ST. JOHN, N.B.

Read before the New Brunswick Dental Association.

At the request of some of my co-workers in St. John, I consented, in 1905, to write a paper on the early days of dentistry in this city, as far as it was in my power to do, and this, by the way, included the early history of dentistry in New Brunswick. The fire of 1877 destroyed to a great extent the records of the past, so I found the task not as easy as I at first supposed it would be. Since then I have found, on further research, that a number of dentists were in St. John, and no record had been made of them. I am able to give you now an unbroken chain from 1823 to 1890, when the New Brunswick Dental Society was formed.

"Mr. Rath, surgeon-dentist, returns his thanks to the ladies and gentlemen of St. John for the liberal encouragement received during his stay in this city. Those who wish further services will please signify the same to him immediately, as he intends leaving this place shortly. 8th February, 1823."

If Mr. Rath did leave St. John in 1823, he returned again, as the following advertisement will show.

July 23rd, 1825, *St. John Couriers* "Mr. Rath having returned from Fredericton, purposes remaining in this city for the season. Those ladies and gentlemen who may have occasion for his professional services are requested to make application at his lodgings, at Mrs. Smith's, opposite the Bank of New Brunswick."

In the same paper, on the same date, is another dental advertisement: "The subscriber respectfully gives notice to the ladies and gentlemen of St. John that he is ever ready to attend to the various operations of the teeth. Whole and half sets, with spiral fastenings, furnished at the shortest notice. Inquire at the house of Mr. Henry Hannigar, corner of Germain and Princess streets (where the Union Club now stands).—Daniel Harwood."

In 1825 the medical men of this Province must have had an Examining Board, and any man who advertised himself as doctor must have been required to pass it, as the following advertisement will show:

"Dental Surgery.—Dr. Harwood (late of the Boston Medical Society) having undergone an examination before the Medical Board of New Brunswick, and being licensed by His Excellency Sir Howard D. Douglas to practise in this Province as surgeon-dentist, respectfully tenders his personal services to all who may

have occasion for them. Applications to be made at his rooms in the Parish of Portland, house of Mr. J. P. Payne. St. John, December 3rd, 1825."

I am informed by Mr. Ward that Mr. Payne's house was situated on Main Street, below Long Wharf.

Of Mr. Rath I can trace nothing beyond the advertisement I have just read to you. So far as I can learn, he was the first dentist to advertise in Fredericton and St. John.

In the biography of Joshua Tucker, by Dr. Burton Lee Thorpe, in the January number of *The Dental Brief*, 1905, I find that Dr. Daniel Harwood became associated with Dr. Tucker, 1833, and that they together are given the honor of being among the first to give us artificial teeth as we have them to-day. Dr. Harwood was born in Barre, Mass., March 21st, 1801. He died at Dorchester, Mass., October 2nd, 1881, in his eighty-first year. I copy the following from his obituary notice in the *Cosmos*, 1882: "At the annual meeting of the American Academy of Dental Science, Boston, of which Dr. Harwood was formerly President, resolutions were unanimously passed, expressive of the Society's estimate of his moral worth and professional character, his energy, talent, courage and fidelity, and in recognition of the fact that he was one of the first in this country to take a high stand in the practice of his profession."

In 1867-8 Dr. Daniel Harwood was Professor of Dental Pathology and Therapeutics in the Harvard University. Dr. S. G. Perry, in an article on "Art" in the dental profession, published in the June number, *Dental Cosmos*, 1903, writes: "I firmly believe that some trace of love of art, and, through it, beauty, can be found in any human being." I question if he would have made that statement had he seen the mechanical work done in St. John previous to the coming of those gentlemen whom I have just mentioned.

I saw a case supposed to have been inserted previous to 1820. It was crude in the extreme.

The first gentleman to honor New Brunswick from Paris was Dr. F. Gouraud. He came to St. John in 1830, as the following advertisement will show:

"Dr. F. Gouraud, surgeon-dentist, has the honor to inform the ladies and gentlemen of St. John and vicinity that he has returned from Boston, and intends to remain but a few days at his house, Prince William Street, near Queen Street, where he will receive those who wish to have any attendance given to their teeth before his departure for Fredericton. He extracts with dexterity broken and decayed teeth, stumps or roots, inserts artificial ones, plugs and fills their cavities with either gold or silver leaves, etc. A variety of dentifrices and tooth powders of a superior quality to be had at his office. August 28, 1830."

Dr. William Bayard describes him as having cut a great dash. He ran in debt wherever he could be trusted, and then left sud-

denly for parts unknown, leaving behind him numerous mourners. Dr. William Bayard's father wrote a parody on his departure.

In 1831 George J. Sylvester came to St. John from London. The following is his advertisement:

"George J. Sylvester, surgeon-dentist, from London, and late pupil of Mr. E. B. Gardette, of Philadelphia, intending to remain a short period in St. John, respectfully offers his services to the inhabitants of this city and its vicinity in the various departments of his profession. Residence at Mr. McKee's, Market Square. George J. Sylvester will, if preferred, attend upon those ladies and gentlemen who may require his services at their own dwellings. Reference may be made to the following gentlemen: A. Cornvah, . . sq., and Dr. J. Paddock. October 29, 1831."

From St. John Mr. Sylvester must have gone to Dorchester, judging from the following advertisement:

"Mr. G. J. Sylvester, dentist, who is now on a professional visit to this place, delivered a discourse upon the "Teeth" on Thursday, May 30, 1833, to a respectable audience, who were much gratified with the information imparted by the lecturer, and expressed their gratification to that gentleman for his gratuitous endeavors to elucidate the principles of that useful branch of science. It is hoped that he may meet with much success in his tour. . . ."

I also found a notice of the following marriage, in 1831, of a Boston dentist to a native of this city. The marriage was performed in St. John, but I have not discovered any notice that he was practising his profession here.

"Married—On Thursday, 30 June, 1831, by the Rev. B. G. Gray, Dr. Condon, Professor of Dental Surgery, Boston, to Miss Harriet Calvert, second daughter of Mr. Richard Calvert, of this city."

In 1833 we have Mr. P. Marter, who had the following advertisement: "Mr. P. Marter begs that all who may require his services as a dentist will call upon him during the ensuing week, as he intends to leave St. John at the expiration of that time. He offers for rent the house which he at present occupies until the 1st of May next. August 24, 1833.

John Hutcheson advertises as Jeweller and Dentist in 1833.

Messrs. Brown & Avery came to St. John in 1834.

"The citizens of St. John are respectfully informed that Messrs. Brown & Avery, dentists, of the City of New York, have visited their city for the purpose of practising in the dental Profession for a few weeks during the warm season.

"The subscribers have been long convinced that the benefits which should result from the practice of the dental art can never be realized without the exercise of great care and skill, and in order to afford them the best opportunity for perfecting their operations, and for mutual convenience, they have formed a co-partnership and divided between them the two departments of Surgical and Mechanical Dentistry. Messrs. Brown and Avery solicit the investi-

gation of their professional character, and will be happy to present their credentials to those citizens who have an interest in ascertaining it. They are provided with every approved variety of substitute for natural teeth . . . among which are some of the best specimens of Mineral Incorruptible Teeth . . . from the manufacturers of Europe and America, selected by Mr. Brown, who has for the past several years manufactured and prepared them for use . . . and who will attend to the Mechanical Department.

"The subscribers will receive calls to make appointments for performing operations at all hours of the day, till 4 o'clock in the afternoon of every day in the week (Sundays excepted), until the 23rd inst., . . . after which time they will remain in St. John only a sufficient time to complete the engagements made previous to the above date. . . Persons who desire to have the advice of a dentist with relation to their teeth are invited to call, and no charge will be made for professional opinion . . . which will be most cheerfully given in all cases. This precaution of obtaining the advice of an experienced dentist is especially recommended for the junior members of families.

"For the purposes of more fully communicating the methods and views of the subscribers, arrangements have been made to deliver a few Public Lectures on the subject of their profession—connected as it is with dietetics—and the first, which will be gratuitous, will be given at the Masonic Hall on Wednesday evening next, commencing at 8 o'clock precisely.

"Rooms at Miss E. Williamson's New Boarding House, two doors south of Mr. McMillan's store, Prince William Street."

"SOLYMAN BROWN,

"SAMUEL AVERY.

"St. John, July 12, 1834."

In 1836 Mr. L. E. VanBuskirk came to St. John and advertised as follows:

"Mr. L. E. VanBuskirk will practice the various branches of Dental Surgery in this city for a few weeks. He will insert either the natural or the mineral teeth, the latter of which is superior in beauty, duration and comfort. Mr. VanBuskirk begs leave to mention that he extracts teeth with an instrument in every respect preferable to the ordinary turnkey, as it does not wound the gum, or cause so much pain.

"Residence at Mrs. Cooks, Prince William Street.

"Reference, Dr. Bayard.

"Mr. VanBuskirk would respectfully observe that it is his intention to visit this city annually for the purpose of practising Dental Surgery; consequently, regard for his reputation will induce him to pay the utmost attention to his duty.

"St. John, April 30, 1836."

The weeks lengthened into years, however, for we find that in 1840 Mr. VanBuskirk took his brother into partnership with him,

and the first time that ether was administered in St. John for extracting teeth was in the office of the VanBuskirks by Dr. William Bayard. Dr. Bayard tells a very amusing story of all the precautions he took with his lady patients, and also the preparations made by the dentists in case the patient gave signs of being at all unruly. If she had been a raving maniac she could not have been more closely secured before they attempted to administer the anesthetic. This was in 1844, shortly after Dr. Horace Wells, the American dentist, discovered surgical anesthesia. One of the VanBuskirk brothers married Miss Reid, daughter of a prominent pilot. Miss Reid at that time was considered the handsomest lady in St. John. The VanBuskirks left St. John in the early fifties, one going to Halifax, the other to Montreal.

In 1836 St. John was again honored by having another dentist from Paris, Monsieur Julius Dilley, about whom the following advertisement appears:

"Monsieur Julius Dilley, surgeon-dentist, from Paris and London, respectfully announces to the gentry and the public generally that he constructs and supplies artificial teeth of every description—from a single tooth to a whole set—on the most approved and permanent principles, either of the Mineral, Sea Horse, or natural teeth. . . . Carious teeth stopped with gold, silver, platinum, mineral succeedaneum, and Mons. Julius Dilley's *Bedouin Cement*, which, when placed in the cavity of the tooth, hardens into enamel in a few seconds, without pain, heat or pressure, and effectually cures the most excruciating toothache.

"Children's teeth, if ever so deformed, may be carefully regulated so as to form a complete and beautiful set in after life.

"Residence, Sooullar's Brick Building, King Street.

"Charges in all cases strictly moderate.

"St. John, 25 June, 1836."

A Dr. Whitney came here from Maine in 1837 and opened an office on the corner of Germain and Church streets. He was a man of prepossessing appearance, and was well liked by those who sought his professional service. Nevertheless, he could not work up a practice to his liking, and after a few years left for New York, where he entered upon a lucrative practice.

The following gentlemen must have been stars of the first magnitude. One thing is certain, they had but a short life in this community.

"Dentistry.—Messrs. Ver Valen & Thorne, of 281 Broadway, New York, surgical and mechanical dentists from London, respectfully inform the citizens of St. John that they perform every operation in dental surgery on the most approved principles now practised by all European dentists of celebrity.

"Rooms at Mrs. Belyea's, Germain Street, opposite the Baptist Meeting House. Patients at their residence, if preferred. September 9th, 1840."

What a pity it is that St. John has no record of these distin-

guished gentlemen. I cannot find among my old friends an individual who has any recollection of them.

In the *Courier* of August 8th, 1844, is the following interesting advertisement:

"T. Hutchinson, dentist, begs leave to acquaint the ladies and gentlemen of St. John and its vicinity that he has removed his office to King Street, in the house owned by W. P. Reid, a few doors below the St. John Hotel, where he is prepared to execute with promptness all orders in the list of his profession. Incompatible teeth set on gold plates or pivots, from one to full sets, as may be required. Extracting, sealing and plugging teeth done in the best manner. Clocks, watches and jewellery repaired."

T. Hutchinson, with his brothers, William and George, landed in St. John from England in 1819. William was the grandfather of Mr. D. L. Hutchinson, meteorological director. T. Hutchinson took up dentistry, as did also a son of his, named George. I know the younger Hutchinson always went by the name of George, for Dr. T. D. Forster told me he frequently had him to assist him in his mechanical work.

Dr. Cyrus Fiske came to St. John from Salem, Mass., in 1846. Following is his advertisement:

"Dr. Fiske is now in this city, and will attend to all calls in his profession.

"Office for the present at George W. Busteed's, Germain Street. January 3, 1846."

By his professional skill and courteous manner, he soon entered into an extensive practice. Dr. Fiske was one of the old school, who did more in the line of moulding and carving porcelain teeth. He was one of the first to make what are now called carved block teeth. Gold plate was the principal thing used. Dr. Fiske had a great prejudice against rubber work, as he called it. The moulds of the S. S. White teeth, in the sixties, did not meet with his approval: so he frequently sent moulds, especially the molars, to S. S. White to have him improve upon his blocks. This is no way displeased Mr. White, for he told me in a conversation I had with him in 1867, in Philadelphia, he was always pleased to hear from his old friend, Fiske, and that his suggestions were good. The Doctor was a good shot, as well as a good fisherman, and was a great admirer of the drama. As a boy, I never visited the Old Lyceum without seeing the genial Doctor taking in the performance. As an oculist and aurist, he had a good reputation, and had a large practice in these specialties. Dr. Fiske married Miss Boyd, of St. Andrew's. His family consisted of three children—Dr. Campbell and Dr. Cyrus Fiske and Mrs. Inches, wife of Dr. Inches, who is the only one of the family living. Dr. Fiske died August 3rd, 1874, aged 54. Few professional men went down to the grave more truly beloved by his patients and those who knew him than Dr. Cyrus K. Fiske. Dr. Fred Robinson, a leading dentist in Boston, studied with him. Dr. Robinson died in 1904.

Dr. Joseph C. Hatheway was graduated in 1850 from the Philadelphia College of Medicine. In 1852 he commenced to practise dentistry in St. John, and in 1854 the Philadelphia College of Dentistry conferred upon him the honorary degree of Doctor of Dental Surgery. Dr. Hatheway took a very active part in Masonry, and was one of the most prominent Masons in St. John in his day. Dr. Hatheway compiled and published a pocket manual of the craft degrees. His knowledge of the ritual was such that the Grand Lodge appointed him instructor of the work, and in this capacity he became instructor to various lodges, or within their jurisdiction. He was a great sufferer by the fire of 1877, but bore his loss manfully. In 1891 he retired from practice, and died April 22nd, 1899, at the advanced age of 78. He was the first St. John dentist to administer nitrous oxid for the extracting of teeth.

Dr. T. D. Forster, who had studied with a brother of Dr. Cyrus Fiske, in Salem, Mass., opened an office on the corner of Germain and Queen streets in 1855. A few years later he moved to what was then known as the "Ratchford House," located where the residence of Dr. Inches is at present. Here he practised till 1870, when he went to Philadelphia, leaving the good-will of his practice to Drs. Haley and McAvenney.

Dr. Fiske at one time, when referring to Dr. Forster, said that if they should together open an office in Paris they would soon work up a large practice. This, I believe, was because Dr. Forster, like Dr. Fiske, was a born mechanic. His plate-work is not to be excelled to-day, and as a manipulator of gold, he was excellent. Dr. Forster was an enthusiastic Mason, holding the highest degree in the Province. He took an interest in all kinds of sports, and I am pleased to say he is still living, enjoying his later days in Norristown, Pennsylvania.

Mr. Clarence Ward states that in 1855-6 we had a Dr. Thompson practise here. His stay was short, and he died shortly after leaving St. John, at the home of his father, who was a well-known physician on the North Shore.

Dr. Edmund Ironsides Hewitt, who was a graduate of the University of New Brunswick, and a young man of much promise, opened an office on King Street in 1866. But he soon had to retire from practice on account of failing health, and died April 23rd, 1868, in his twenty-fourth year.

Dr. Somers informs me that Dr. Perkins was the first dentist to practise in Moncton. He was followed by Drs. Cross, Rogers and Duffy. Prior to these men the place was visited by itinerants, Straw and Chiverie, the latter being a Frenchman.

In 1867 St. John was honored by having still another dentist from Paris, Louis de Chiverie by name. Louis, for some years, hovered between St. John and Halifax, taking in the towns of New Brunswick and Nova Scotia. He was noted for his outdoor display. In fact, no such character has visited us since. He impressed himself so much on the members of the Nova Scotia Legis-

lature that when Dr. Allen Haley presented a bill to regulate dentistry in that Province, in 1869, it was rejected.

In the same year I endeavored to get a bill through the New Brunswick Legislature, but, meeting with opposition from some dentists in St. John, I withdrew it, and so we remained without a law to regulate dentistry in New Brunswick until 1890.

Dr. Cunningham, who came to St. John from Annapolis, N.S., in the early sixties, opened an office on Germain Street, near the corner of King. Dr. C. W. Bradley, of Moncton; Dr. Arnold, Sussex, and Dr. Dan A. Pugsley, now retired, were students of Dr. Cunningham. While duck-shooting on Foshay Lake, Dr. Cunningham and a companion named Foster were drowned by the upsetting of their canoe, on the 10th of September, 1875. Dr. Cunningham's brother succeeded him in practice, but after a few years he went to Annapolis.

Drs. Goodfellow and Frost had an office on King Street, about where the establishment of Macaulay Brothers now stands. They practised together but for a short time. Dr. Goodfellow left St. John for Sussex, where he died a few years ago. Dr. Frost continued practising in St. John for five or six years.

Dr. Canby Hatheway was graduated from the Pennsylvania College of Dental Surgery in 1868, and in the same year started practice in St. John. In 1885 Dr. Hatheway left for Paris, where he had a good practice, but ill-health compelled him to leave France, and he started again for St. John. He remained here until 1901, when he removed to Halifax, but at the present time is in Berwick, N.S., where he has an extensive practice, and I am sure his friends will be delighted to hear that he is enjoying good health.

In September, 1870, Drs. Haley and McAvenney succeeded to the business of T. D. Forster. Dr. Allan Haley was graduated from the Philadelphia Dental College in 1866. Our partnership lasted only one year, he having married a Miss Smith, of Windsor, N.S., daughter of Bennet Smith, Esq., for family reason removed to that town and began the practice of dentistry. After a few years he retired from the practice of his profession and went into the insurance business. He had always a love for politics from his school days. He represented the County of Hants in the Provincial Legislature for several terms. He died at Ottawa on April 23rd, 1910, while representing the County of Hants in the Dominion Parliament. The Minister of Finance, who was a very dear personal friend of Dr. Haley, conveyed his remains in his private car to Windsor, N.S., where they were buried.

Dr. F. K. Crosby, who was graduated from the Philadelphia College in 1867, took Dr. Haley's place as my partner in 1871. Dr.

Crosby, by his kindly disposition, soon became a favorite with everybody with whom he came in contact. In addition to being a good all-round dentist, he was by far the most cultured literary man dentistry has had in the Maritime Provinces, and I question

if, in Canada to-day, among all our bright men in dentistry, there is one with the literary attainments that Crosby possessed.

The last article that Crosby wrote appeared in *Scribner's Monthly* during 1874. It was headed "Gastric Literature," and its object was to show up those English writers who introduced the palate and the stomach into everything they wrote. Dr. Crosby was a poet as well as a prose writer. His "Lily in the Linden" was a beautiful poem. His "Lorraine," published in the *Boston Advertiser*, was afterwards universally published. It is to be found in Longfellow's poems of places. "Answered," another poetic gem, appeared in *Appleton's*. He wrote for the *New York Independent*, *Springfield Republican*, *Canadian Monthly* and *Dental Cosmos*.

Dr. Crosby was offered a professorship in the Philadelphia Dental College, in 1868, but declined the honor. He was married to a Miss Fannie Hammond, of St. John. His health became so poor that he was ordered to California. He died in San Diego, December 3rd, 1874.

In 1879 Dr. J. E. Griffith started practice in St. John on Charlotte Street. He was living on the corner of Germain and Duke streets when he was burned out by the fire of 1877. His office, after the fire, was in Mrs. Keator's Building, 24 Germain Street. In 1886 Dr. Griffith removed to Woodstock with his family. He is now practising in Waverley, Mass.

Dr. Moses Gross practised dentistry in St. John from 1871 to 1876, but removed before the fire of 1877 to Moncton, thence to Albert County, where he practised for a number of years. He

Dr. J. McKenzie Campbell Fiske was born in St. John March 19th, 1847. He graduated B.A. from Harvard, 1868; A.M., 1868; M.D., 1871; D.M.D., 1876. Dr. Campbell Fiske was a son of Dr. Cyrus Fiske. He did not enter upon the study of dentistry till after his father's death. He was a good student and a good friend, was of a retring disposition, but was full of life and had a keen sense of humor. Dr. Fiske was familiar with the best literature, and took an interest in all matters of art, music, etc. While at Harvard University he embraced every opportunity of hearing the best lecturers, actors and musicians who came to Boston. He was a lover of Emerson, and counted it among his greatest privileges that he had heard him deliver one of his memorable addresses. With Oliver Wendell Holmes, who was then professor and lecturer at the Harvard University Medical School, he had frequent intercourse, so that in taking up his professional career he brought from the alma mater not only considerable technical knowledge and a deep interest in the progress of medical science, but also that culture of intellect and taste which is the finest product of university association, and which, in Dr. Fiske, would, no doubt, have reached still higher development had his life continued. He was an oculist and aurist, and, I think(in these specialties he would have been a great success. I lost, in the death, of Dr. Fiske, which occurred

July 4th, 1877, one of the dearest friends of my younger days. He married Miss Emma Skinner in June, 1873. Mrs. Fiske is a lady of fine literary taste, who has long been active in philanthropic work.

Dr. D. A. Pugsley commenced practice in 1875. He retired from practice in 1881. Dr. Bradley became a partner of Dr. Pugsley in 1876, and was with him for one year, when he removed to Monocton.

Dr. A. McAllister was graduated at the Pennsylvania College of Dental Surgery in 1874. He practised in Brooklyn, N.Y., and then removed to Bear River, N.S. He came to St. John in 1876; afterwards he took up his abode in Fredericton, commencing practice there a few months after the fire. He died in Australia after being there but a short time.

George Peters Caldwell was born about 1850. He began the study of dentistry under his brother, Botsford Caldwell, in Boston, Mass., was graduated at Harvard Medical College in 1874, at the Dental College in 1875, and began the practice of dentistry in St. John immediately on his return. In 1882 he married Steen, daughter of William Livingstone, M.D., who died in October, 1902, leaving no children.

He gave up the practice of dentistry in 1884, and removed to Halifax; where he engaged in the practice of medicine, giving that up in turn to resume the practice of dentistry in South Boston, Mass. His health not being the best at this time, and not being quite satisfied with the necessary drudgery of the dental office, he gave up this work and made several transatlantic and transpacific voyages as ship surgeon on passenger steamers. After a few years in practice of medicine in London, Eng., he removed to Oxala, Mexico, where he died April 25th, 1908, aged 60 years. Thomas A. Hallet, of Sussex, now in St. John's, Nfld.; J. M. Magee, and W. H. Graham (brother of Mrs. G. O. Hannah), who died in London, England, were students of his.

Dr. George Osborne Hannah began to study in the office of Dr. J. E. Grant, Calais, Maine, 1873, was graduated from Philadelphia Dental College, March, 1876, and comes next to me as the oldest graduate in the Province. He opened an office in St. John that same year, and at the present writing has occupied the same premises continuously for 35 years.

Dr. E. Sangster practised in an office on Main Street for some years previous to 1890, but left here in 1892.

Charles M. Godsoe entered into partnership with his brother Frank in 1884, but left St. John for Trinidad some fourteen years ago.

Dr. J. M. Smith was graduated from the Boston Dental College in 1878. He was one of the scrutineers appointed by the Government under the Dental Act of 1890, and practised in the North End up to 1904, when he retired.

Dr. William H. Steeves was graduated from the New York

College of Dentistry in 1888. He started practice some years ago in St. John, and now has a lucrative practice in Fredericton.

Through the efforts of Dr. C. A. Murray, of Moncton, a meeting of dentists was called in 1889 at the office of J. M. Magee, of St. John. I was honored by being made chairman of that meeting. Dr. Magee acted as Secretary. The meeting decided to have introduced at the following session of the Legislature a law governing the practice of dentistry in New Brunswick. Dr. Murray had the bill drafted, and the Legislature, in 1890, passed what is now known as the "New Brunswick Dental Act of 1890." This Act was further amended in 1893, 1896, 1903, 1906 and 1911.

Drs. B. H. Torrens and J. M. Smith were appointed scrutineers by the Government to report on those who were eligible to practise. The first meeting for the purpose of organization was called at Fredericton in August, 1890. The honor of being elected President fell to my lot. Dr. Torrens, of Fredericton, was made Vice-President, and Dr. C. A. Murray, Secretary-Treasurer.

The Dental Council was formed by four members elected by the Dental Society, and three appointed by the Governor-in-Council. At this meeting the gentlemen elected were: Drs. J. M. Magee, of St. John; B. H. Torrens, of Fredericton; W. D. Camber, of Woodstock, and W. H. White, of Sussex.

The Government a month later appointed Drs. C. A. Murray, of Moncton; J. G. Sproule, of Chatham, and A. F. McAvenney, of St. John.

It devolved upon me to call a meeting of the Dental Council in the following October in St. John at my office. Dr. C. A. Murray was elected President of the Council, and Dr. J. M. Magee, Registrar, and so the first organization of the dentists of this Province was effected.

The object of this paper is to place in proper form a number of facts of which this Society has no record, and, as far as possible, I have attempted to do this.

I have not considered it necessary to make particular mention of those gentlemen who have entered the profession since the year 1880, for their names will be contained in the records of the Society, and some future analyst, a little further removed from the present time, will not fail to do them honor.

ELECTRICITY FOR DENTISTS.

F. D. PRICE, D.D.S., TORONTO, ONT.

CHAPTER IV.

ELECTRIC BATTERIES (PRIMARY).

The earliest artificial means of generating electricity in considerable quantities was by batteries. It is both simple and interesting and will probably continue to be used by nearly every dentist for one or more purposes. There is an evenness and smoothness in a battery current making it very desirable for therapeutic use.

The reader will recall a statement in the introduction about metals being positive or negative in relation to each other and probably why they are so. Volta, from whom our word volt is named, found a difference of electric potential between the following pairs of metals, while Ayrton and Perry have tabulated the exact differences. Those first named are positively electrified in relation to those following.

DIFFERENCE OF POTENTIAL.

Zinc	}	Volts.
Lead		
Tin	}	"
Iron		
Copper	}	"
Platinum		
Carbon	}	"

The difference of electric potential between zinc and carbon will be found by adding the successive differences, or 1.09 volts.

Suppose that a plate of zinc and a plate of carbon be partially immersed in dilute sulphuric acid, a *conducting fluid* that attacks them unequally. If there is no metallic contact they will still possess a difference of potential of 1.09 volts. If a copper wire be connected to the plates outside the liquid there is a rush of electricity from the carbon to the zinc to equalize them. But chemical action immediately sets in as if in an effort to preserve the inequality, and we find a current of electricity flowing in the liquid from the zinc to the carbon. Thus a continuous flow of electricity is maintained in the outer conducting wire. Ordinarily chemical action produces heat. If zinc be immersed in dilute sulphuric acid it is dissolved by chemical action with the production of considerable heat. In the electric battery the chemical energy produces electricity and not heat. One cup is called a *voltaic cell*, Fig. 11. A number joined together are called a *battery*. Sometimes the name

of another early experimenter, Galvani, is used, and we call it a *galvanic battery*.

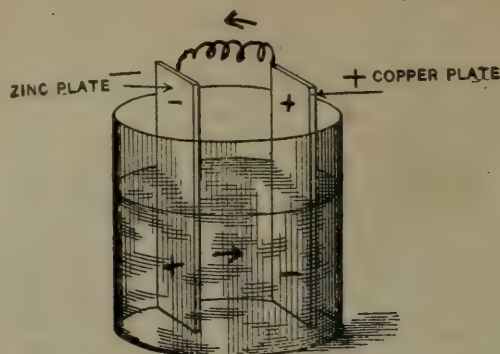


FIG. 11. VOLTAIC OR GALVANIC CELL.

Our units, volt, ampere and ohm, are obtained from a special cell that is taken as a standard. It produces one ampere of electricity at a pressure of one volt through a resistance of one ohm.

Suppose that we are using cells that produce about one ampere each at a pressure of one volt and we need to have one ampere at five volts pressure to operate a mouth lamp. We would need to connect five cells in series as shown in Fig. 12. It will be seen that metallic connection is made between the carbon of one cell

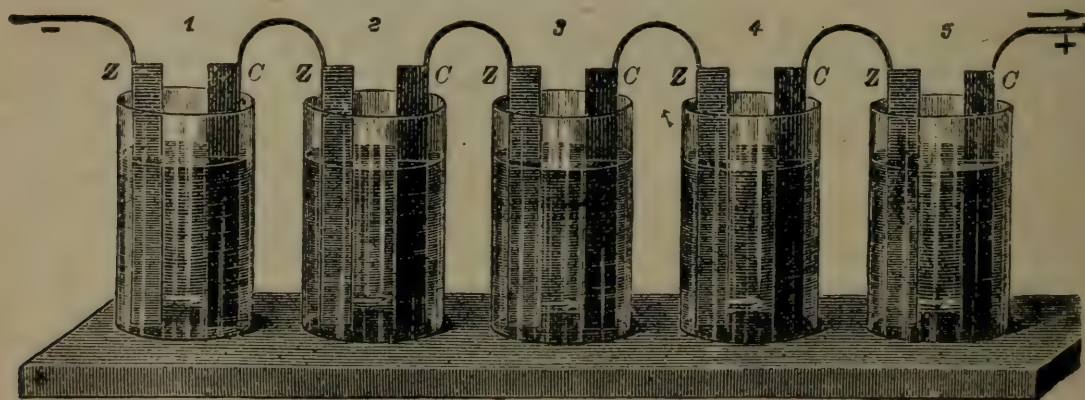


FIG. 12. SHOWING CELLS CONNECTED IN SERIES.

and the zinc of the next, and the external circuit will be from a carbon, through the lamp and back to the zinc of the first cell. Where wires are connected to cells the metals should be bright and firmly screwed together or soldered. Loose connections mean serious loss from resistance by poor contact.

An arrangement such as Fig. 13 would give six amperes at a pressure of one volt. This is arranged in parallel or multiple. Connections are made from all the carbons to one leading out wire and from all the zines to the other leading out wire.

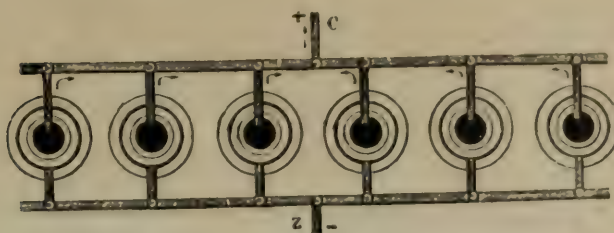


FIG. 13. SHOWING MULTIPLE CONNECTION.

In Fig. 14 we have six cells arranged in *multiple series* to produce two amperes at three volts pressure.



FIG. 14. MULTIPLE SERIES CONNECTION.

It will be seen that in Figs. 13 and 14 we have the same number of watts produced. Thus, by the proper arrangement of a sufficient number of cells, we may obtain any desired amperage at any voltage desired.

To better understand a battery, let us return to the simple cell of Fig. 11. The reader must not be confused by marking of opposite polarity on the plates or *electrodes* in the liquid and at the outer ends. A recollection of the positive and negative poles of a magnet should clear that away. Perhaps a better understanding of the chemical action that takes place will be seen by reference

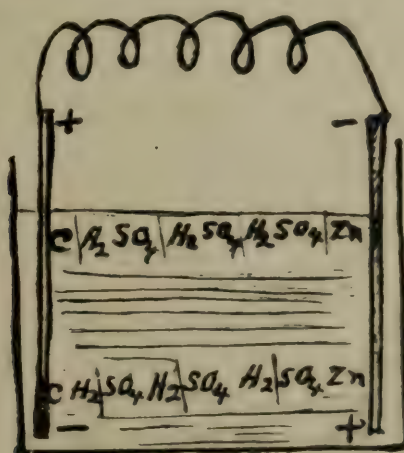


FIG. 15. CHEMICAL ACTION IN SIMPLE CELL.

to Fig. 15. Before the external circuit is completed and so before electric energy is produced, the chemical formula may be represented by the upper chemical expression showing the carbon, the sulphuric acid and the zinc. The lower line better represents the chemical action in the battery. The zinc unites with the sulphur radical in the acid and displaces the hydrogen, which probably unites with the sulphur radical in the next acid molecule, displacing its hydrogen radical, and so on to the carbon plates. Ordinarily when zinc dissolves in sulphuric acid solution, hydrogen gas rises freely to the surface of the liquid. But in the electric battery we are describing the hydrogen gas, being electro-positive, is attracted by the electro-negative carbon, and so collects over the surface of the carbon. Here it stops the action of the battery in two ways. It is a non-conductor and stops the current in the degree to which it accumulates. It is of opposite polarity to the carbon and so neutralizes the polarity of the carbon. Thus the cell is said to become *polarized*. If such a battery were used for a mouth lamp or any other power, the lamp would soon grow dim or the power weaken. Some method must be introduced to continually *depolarize* the battery.

If such a battery as just described be used in *interrupted* work, as ringing a door bell, the hydrogen does not have much time to collect during the actions of the electric current, and the hydrogen escapes freely to the surface when the battery is not in operation. Such a battery is said to be on *open circuit* work.

Various mechanical and chemical methods have been devised for depolarizing. One of the simplest is shown in the gravity cell

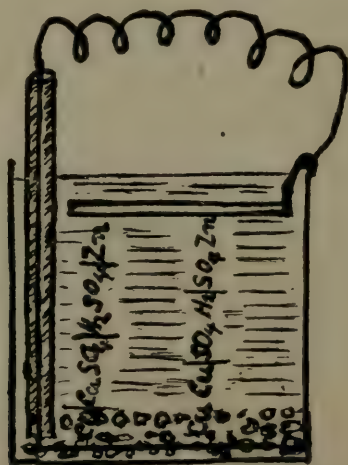


FIG. 16. GRAVITY CELL.

illustrated in Fig. 16. It will be seen to be electro-chemical. In the bottom of a large jar is laid a copper plate, and on it an inch or two in depth of copper sulphate crystals. A glass tube should be provided through which to renew the copper sulphate to the copper plate as it is used. The leading out wire from the copper plate might pass out through this glass tube for proper insulation.

The jar is nearly filled with a weak solution of sulphuric acid and a zinc plate is immersed and supported near the top. The chemical action is indicated in Fig. 16. In the left-hand expression the copper, the copper sulphate, the sulphuric acid and the zinc plate are indicated. On the right is shown the solution of the zinc by the sulphuric acid giving its hydrogen radical to the copper sulphate, which deposits its copper radical on the copper plate. Thus we see that the hydrogen never reaches the copper plate to polarize it. In the gravity battery the copper plate increases by the deposition of copper from the copper sulphate, which, therefore, must be frequently renewed through the glass tube. The amount of sulphuric acid in the solution remains constant while the zinc sulphate increases by the decomposition of the zinc plate. The copper sulphate, being the heavier solution, remains at the bottom, if the cell be not moved about to mix the solutions. Hence the reason for the name *gravity* cell. The electro-motive force of the cell is not high, being .73 volts. A larger number of cells would be needed than of those giving higher voltage.

Another method of preventing polarization was invented by Mons. Leclanché. The carbon electrode is placed in the centre of a porous cup. About the carbon is packed a mixture of manganese dioxide and fragments of carbon. The top of the porous cup is usually sealed with pitch. A zinc rod forms the negative electrode and sal-ammoniac the exciting fluid, or more properly called the *electrolyte*. The zinc dissolves, forming a double chloride of zinc, while hydrogen and ammonia gas appears at the positive electrode. The manganese dioxide gives off oxygen, which unites with the hydrogen gas, forming water, which is inert. If used for a considerable time, the hydrogen gas accumulates owing to the slow action of the manganese dioxide in liberating oxygen and the power of the cell begins to fall. The cell must then be allowed to rest a short time. The Leclanché cell has been largely used for

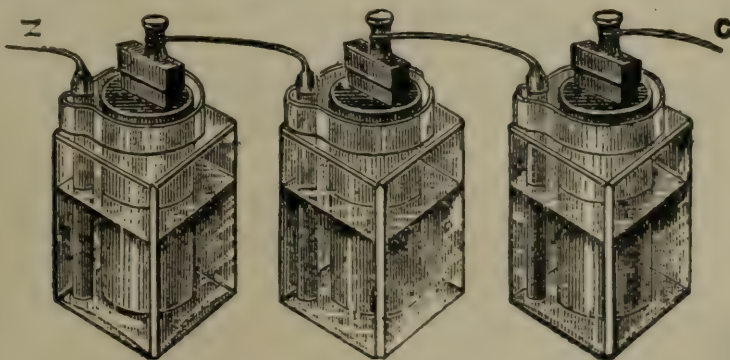


FIG. 17. THE LECLANCHE BATTERY.

ringing alarms and door bells. Three Leclanché cells are shown in Fig. 17 coupled together in series.

A very simple and very common form of battery cell for such interrupted work as bell ringing is shown in Fig. 18. The Law

battery takes advantage of a large surface area of carbon to take care of the hydrogen gas. The carbon takes the form of a large cylinder open at one side, in which stands a zinc rod. The area of the carbon surface should be about fifty times that of the zinc. The exciting fluid is sal-ammoniac solution. Either the Law or the Leclanché battery may be used for operating an electric gold mal-

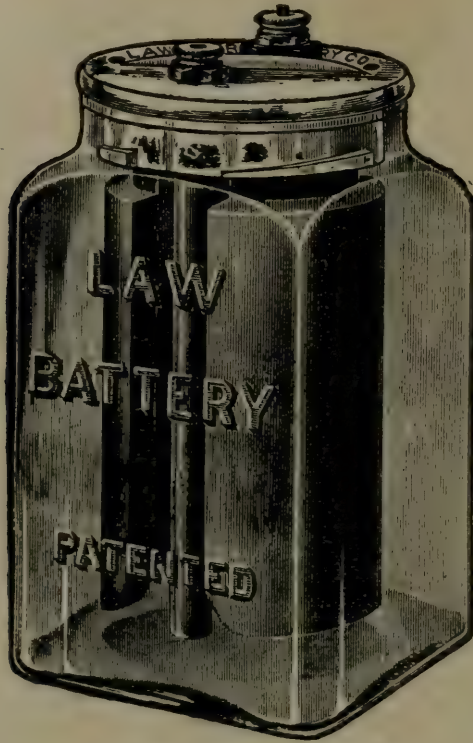


FIG. 18. THE LAW CELL.

let. It may be generally stated that the amperage output of a battery is in proportion to the surface area of the electrodes and with the chemical solution of the zinc where the zinc is pure. Hence a large cell supplies more amperes than a small one.

The voltage or electrical potential is not affected by the size of the cell. A lady's silver thimble has been used as a battery to send messages across the Atlantic ocean. If a large cell and a very small one of the same character have their wires connected so as to oppose each other no current will flow.

If the zinc is pure there is no chemical solution of it while the battery is at rest. Commercial zinc contains impurities whose electric potentials are different from that of pure zinc. Hence small local batteries exist over the surface of the zinc plate. These weaken the current from the cell by lowering the electro-positive relation of the zinc electrode to the carbon. They also waste the zinc. To avoid this loss the zinc electrode may have its surface amalgamated either by rubbing mercury over its surface or melting a small amount of mercury in the zinc before casting the electrodes. Only pure zinc will appear at the surface of the mercury.

The carbons used in batteries are porous and the liquid electrolyte saturates it and comes in contact with the metal attachment for the leading out wire. This causes a local circuit, which in time eats away the metal and also reduces the current from the cell. To avoid this waste the part of the carbon which is intended to extend above the liquid is saturated with melted paraffin. A little trouble may be caused by evaporation, thus reducing the quantity of liquid in the jar. Or the electrolyte may creep up the sides of the jar or the electrodes and by evaporation deposit the contained salts. This is avoided by hermetically sealing the top of the jar or by a thin layer of oil over the electrolyte. Often the zinc rod in a cell is seen to be dissolved most rapidly or to be eaten off near the top of the fluid. This is usually found in the sal-ammoniac cell which is most common in use for house bells. It is generally due to placing the sal-ammoniac salt in the bottom of the cell, then pouring on water, and then placing the cell on the shelf where it is not disturbed. The salt dissolves slowly, forming a denser solution at the bottom of the jar than the top, and this difference in the density of the solution causes a local action at the expense of the upper part of the zinc. It must be apparent to any person having the care of a galvanic battery that the dissolving of the zinc means also a chemical change in the electrolyte, hence both the zinc and the electrolyte must occasionally be renewed.

A type of cell called the *dry cell* has come into favor chiefly because of its cleanliness and portability. It may concern the



FIG. 19. DRY CELL.

dentist most if he possesses a gasoline motor car or motor boat, as it is largely used for producing electric sparks for ignition purposes. The retaining cup is composed of sheet zinc and forms the zinc electrode. A binding post is soldered to the upper edge to receive the leading out wire. The carbon plate (Fig. 19) is placed in the centre of the cup and is surrounded with a paste which

forms the electrolyte. A great many different compositions of paste are used by different manufacturers. The formula of one is given as: Zinc Oxide 1, Sal-ammoniac 1, Zinc Chloride 1, Plaster 3, and Water 2 parts. The top of the cell is sealed with a layer of pitch. The electro-motive force of a dry cell is about 1.3 volts. Most makes of dry cell become polarized if in use, but a few of them are quite constant.

Dry cells give most current when new. Usually they weaken and in time give no current, even if not in use. One method of renewing them is as follows: Remove the paper cover and perforate the zinc with small holes an inch apart. A hammer and a two-inch nail may be used for this. Stand the cell in a glass jar and fill the jar to near the top of the cell with a solution of sal-ammoniac. When the cell has become saturated with the solution it will be found to do good service again.

There is an almost endless variety of primary cells, so we cannot do any more than treat of principles in a work of this kind. We have seen that zinc is consumed to supply electric energy. Zinc becomes an expensive fuel when used to supply large quantities of electricity and gives place to coal. The energy of coal is still used in the round-about way of the steam engine and the dynamo, but it is hoped a means will be discovered to obtain electric energy from coal either directly from its heat or else by its chemical solution. A pound of carbon in burning yields as much energy as a horse-power applied for over five hours.

Dominion Dental Journal

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TORONTO, DECEMBER 15, 1911

No. 12

A DENTAL CLINIC IN TORONTO FOR CHILDREN.

It is practically settled that a dental clinic for children will be established in Toronto. The matter has been under consideration for more than a year. It has been twice before the Board of Control, and finally got their consent. Mr. Hocken, a member of the Board, trotted out the old argument which has done duty to prevent progress for centuries: paternalism, pauperizing the public, buy their clothes next, etc. He couldn't frighten anyone, however.

The clinic is to be established under the Department of Public Health. It took some time and patience on the part of the Dental Committee to persuade the Board of Education and other interested parties to the view that the care of the teeth of the poor is primarily a matter of public health and only indirectly a matter

of education. Public health is a state matter, in fact a national matter, while education by our constitution is more or less local.

It is expected the clinic will be governed by a board of trustees, while the immediate direction will be by dentists.

Through the energy of the committee and the philanthropy of a few wealthy citizens, the complete equipment for the clinic will be donated. Private donations will always be acceptable, but before the clinic could be placed upon a secure basis a definite annual income had to be secured. This has been promised by the city. The Medical Health Officer placed the following estimate for six chairs before the Council:

Salaries of dentists for half-day.....	\$6,000.00
Salary of nurse.....	500.00
Rent and janitor.....	500.00
Heating	100.00
Telephone	50.00
Supplies, laundry, etc.....	500.00
<hr/>	
Total	\$7,650.00

THE INFECTED TOOTH BRUSH.

The baneful effects of the tooth brush are going the rounds. Tooth brushes become infected the first time they are used, and remain so unless boiled, which destroys them, or are kept in a strong disinfectant solution. Each bristle is said to be a needle penetrating the gums with infection. Dr. W. P. Caven, in a recent article before the Academy of Medicine, Toronto, published in the DOMINION DENTAL JOURNAL, November, 1911, gives voice to the above views. A new tooth brush is suggested for each brushing.

What of this scarecrow? It must be assumed that it is not a family tooth brush which is referred to. The micro-organisms which originally infected the tooth brush came from the user's mouth and are still there by the millions. If they have been present for days, weeks and years in the mouth without causing infections of a serious character, why should they do so if allowed to remain out of the mouth on a cold brush for a few hours when again returned to the same mouth? The fact is we become immuned to our own micro-organisms, but may become seriously infected by the same variety of organisms when they are grown under a different environment, as in the mouth of another person. Tooth brushes should be cleansed and disinfected, but even if they are not so treated there is little chance of serious consequences.

Proceedings of Dental Societies

NEW BRUNSWICK DENTAL ASSOCIATION.

St. John, N.B., July 11th, 1911.

The twenty-second annual meeting of the New Brunswick Dental Society was called to order at 10.30 a.m. on the above mentioned date in the Keith's Assembly Room at St. John, N.B. Dr. E. R. Hart in the chair.

Present: C. A. Murray, Moncton; E. G. MacLean, Cambridge, N.B.; H. W. Murray, Sheriac; F. W. Barbour, Fredericton; E. R. Hart, Sackville; F. C. Bonnell, St. John; L. A. Langstroth, St. John; H. B. Nase, St. John; J. G. Leonard, St. John; Otto Nase, St. John; L. H. Somers, Moncton; H. W. Snow, Sackville; P. J. Gallagher, Moncton; H. S. Thomson, Moncton; F. E. Burden, Moncton; F. Gordon Sancton, St. John; J. B. Crocker, Fredericton; H. P. Travers, St. John; B. F. Reade, Moncton; A. F. Mc-Avenny, St. John; F. S. Sawaya, St. John; J. D. Maher, St. John; H. C. Wetmore, St. John; F. A. Godsoe, St. John; W. P. Broderick, St. John; C. F. Gorham, St. John; W. P. Bonnell, St. John; J. J. Daly, Sussex; A. B. Teakles, Sussex.

The minutes of the last annual meeting held at Moncton on July 12th, 1910, were read and on motion confirmed.

The President then read his annual address.

PRESIDENT'S ADDRESS.

E. R. HART, D.D.S., SACKVILLE, N.B.

Gentlemen.—Remembering that on some former similar occasions, where there was no presidential address, there were certain mutterings and dark looks, I came to the conclusion that it would not be well for me to appear without one, even though it might not be very interesting or profitable. However, no one should expect to take this position of honor without assuming its responsibilities, so I shall do so in so far as I am able.

You are all well aware that the profession of dentistry has made wonderful advances in its several branches in the last few years; so much so that whereas only a few years since most dentists practiced all the branches so far as they were called on to do so, now we have specialists in several branches and some claiming that the general practitioner has no right to touch at all. This is especially emphasized in the practice of orthodontia.

Let us consider this last a little. In the first place, except in a large city, there could not be enough practice of this kind to keep one man at all busy, and as each case takes considerable time patients from a distance could not be treated except under great inconvenience and greater expense than would be the case if the general practitioner gave some attention to this branch. This

inconvenience and expense might well be enough in a great many would go through life with deformities greater or less simply cases to prevent any correction being attempted and thus many because they were out of reach of a specialist; while the general practitioner by giving it some study could in some cases bring about ideal conditions, while in others a near approach could be attained, and thus bring relief to many individuals who are not within the reach of a specialist. Now, my idea is not to do away with the specialist, for there is a place for him in cities of large population, where, as he devotes his entire attention to this phase of dentistry, he is able to deal with difficult cases in a more efficient manner than is the general practitioner. However, this need not prevent the general practitioner from doing such work and thus bring much comfort to very many who otherwise might go without.

In the general advance we are all learning to approach a more nearly ideal antiseptic condition in our offices. The stricter attention we give in this direction, the better work we can do and the less trouble we will have with all inflammatory conditions, and not only guard our patients but also ourselves from infection. We will also advance the standing of the profession before the public, as it is rapidly becoming informed in this direction, and many of our patients notice this, perhaps more than we may realize. Perhaps we could do more in this direction than we are at present.

While speaking of information with regard to the public it can be truly said that particular knowledge concerning that which can be done for them by the profession, is lacking to a very great degree with the masses. That this is not as it should be is recognized by all of you, but in what manner to give this information so as to obtain the desired object yet not place the profession in an undignified position, seems not yet to have been agreed on. Some think that distribution of pamphlets by the dentists will do the work, but this has led in some cases to more or less erroneous statements being sent abroad and also allows the inference at least, that the dentist is being put to the front rather than useful dental knowledge.

I think that the suggestion already acted on in some places, that an educational committee appointed to take this matter up and have articles prepared to be printed in our papers would answer the purpose admirably.

In connection with this, I might add that the C. O. P. A. of Toronto has started a public educational campaign and is now trying to enlist the co-operation of committees formed in each of the provinces to further this work by public lectures and placing printed material in our public papers. What we shall do in this direction, I leave for you to consider.

Our association has undertaken some work in the direction of having dental information given to nurses in the public hospitals so that they may be able to give better aid to the patients. This is but a start in the right direction.

There is a further work of establishing dental infirmaries in our cities and towns where those who are too poor to procure dental service may be served free of charge. This calls for at least at first, much of a dentist's valuable time, but perhaps until the public shall have been educated to bear their part of such a burden, it may be we cannot do very much in this direction.

However, we may well remember that we are members of a noble profession and by doing conscientious work we will help it to even a higher plane and be enobled ourselves in so doing.

Dr. Godsoe.—As this report of the President contains certain suggestions which he would like the society to take into consideration, I think it would be a good idea to have it referred to a committee to go over it and bring in a report. I move that the annual address of the President be received and referred to a committee of three, to take into consideration his suggestions and recommendations and report at this meeting.

Dr. C. A. Murray.—The President's address touched upon subjects which I think would be very profitably brought up in discussion, and I think Dr. Godsoe's motion very appropriate. I think that a committee should be appointed, and this committee should bring in the different subjects for separate discussion along the lines which he mentions. For instance, there is the orthodontia treatment, and the specialists, and the education in regard to hygiene, and the discussion in regard to the nurses which he has touched upon. I think that these subjects should be brought out and it would be a good plan for that committee to select from this body certain men to open that discussion, and by so doing I know that we will have a very profitable discussion out of the contents of our President's address. Therefore, I have very much pleasure in seconding Dr. Godsoe's motion.

The motion was voted upon and carried, and the Chair appointed Drs. Broderick, Barbour and C. A. Murray as a Committee.

SECRETARY'S REPORT.

St. John, N.B., July 11, 1911.

To the President and Members, N. B. Dental Society:

Gentlemen,—As Secretary, I beg to submit the following from the office:

Nothing of a serious nature has been brought to the notice of the Secretary during the year—the usual clerical work, correspondence, etc., has been attended to. Reports from the Council state the following have fulfilled the requirements of the law and have been duly registered: Dr. A. J. Cormier, Shediac; Dr. W. R. Wilkes, Fredericton.

The following appeared before the Board on June 28th, 1911, for the purpose of taking the preliminary examination, but as yet have not been reported upon: P. H. Warren, Sussex; G. A. Sproul, Chatham.

The financial standing is as follows:

Receipts from dues	\$220.00
Expenditures as per vouchers	179.12

Balance paid Council\$ 40.88

The heavy expenditure was due to the liabilities in having the Dental Act amended by the Legislature.

Respectfully submitted,

(Sgd.) F. A. GODSOE, Secretary.

Moved by Dr. Manning, that the Secretary's report be received and placed on the table until the report of the Audit Committee should be received. This motion was seconded and carried.

The report of the Audit Committee was then read and was as follows:

To the President and Members of the N. B. Dental Association:

Your Audit Committee beg to report that they have audited the books and vouchers of the Registrar and found the same to be in good order and correct.

Respectfully submitted,

(Sgd.) H. C. WETMORE,

JOHN G. LEONARD.

St. John, N.B., July 11, 1911.

A motion was made that the report of the Audit Committee be received. This was seconded and carried and the Secretary moved that the Secretary's report be taken from the table and entered upon the records. This was also seconded and carried.

Dr. Godsoe.—The annual reports of the Hospital Committees comes next and during the year I have received certain reports from the members who are on that committee from the several towns where hospitals are placed, and the feeling is that the Hospital Boards will allow the dentists to give lectures to the nurses in the hospitals. There has been nothing definite sent me from the hospitals, the committees themselves have reported. Moncton is agreeable, St. John is agreeable, but I have had nothing official from the Hospital Board. I understand Fredericton is agreeable; Woodstock also is taking the matter into consideration, but I have not heard from Dr. Jewett lately. I have heard from Dr. Moore at St. Stephen and everything appears to be all right there, but there has been nothing settled in regard to the matter. Those of the committee who are present might be able to throw some light on the subject from their own towns.

Dr. C. A. Murray.—I took the matter up with the Board in Moncton and I wrote them first an official communication and I have their official answer, which I did not bring with me. I may say that they are very willing indeed that the dentists of the City of Moncton should go as often as they liked and give any instruction along such lines of dentistry as would be beneficial, so long as it would not put any expense upon the hospital. The way the matter stands now in Moncton is that everything is in readiness for the dentists of the city to be appointed to give the lectures. I have

arranged with the matron of the hospital and the board, and have their official statement.

I have been in communication with several of the towns that have hospitals, and I may say I think I reported officially to the Secretary in regard to the decision of our Board. I think Chatham—I have a communication from Dr. Sproule, and the Hospital Board there is willing that instructions should be given so long as they are given free. I asked him, if it would be necessary to have a head or a chairman of the dentists who will impart the knowledge in every town, if he would be willing to take the position, and he said he would be quite willing to do so. I have a communication from him in which he said that the Hospital Board is agreeable. I had one from Dr. Barbour and at the time of writing the Board had not met and I have heard nothing from him since. As to Dr. Moore, I had one letter from him, but at that time the Board had not met. St. John, I understand, is agreeable, and I do not see any reason why we cannot inaugurate that plan of procedure. It is certainly a very important thing if these nurses would take it up and try to impart some knowledge along these lines to their different patients.

President.—That is a very encouraging report.

Dr. C. A. Murray.—I think, Mr. Chairman, I would like you to ask the different members of that committee who are here to-day to give their report as to what they have done.

President.—We will hear from Dr. Barbour of Fredericton.

Dr. F. W. Barbour.—The hospital referred the matter to the Medical Staff and they found it impossible to get a quorum. They got a quorum just a month ago and it reported quite favorably. There was some little difficulty, however; the nurses being overworked and having more lectures than they could attend to now, but they thought possibly they could squeeze in some dental lectures. They recommended to the Board of Trustees that have entire control, that they take on a dental representative, making him a member of the staff and allow him to give four lectures during the season. But it is my belief that they will not listen to the Dental Society appointing the man, that is, they will appoint their own dental representative.

Dr. McAvenny.—Dr. Walker of the St. John Hospital said that everything would be satisfactory.

Dr. Moore said that the Medical Board in St. Stephen is perfectly willing that the dentists give lectures. He did not state who would appoint them, but St. Stephen is in accord with the idea.

Dr. C. A. Murray.—According to Dr. Barbour's report it rather conflicts with the resolution. The resolution says that no one dentist should monopolize those lectures at the hospital, and I think it would be quite a burden upon a man to give four lectures. I do not think we would like to do that in Moncton, we would divide it around and give one lecture a month. If one man is willing to accept the whole responsibility and the others are willing, it might

be all right; but I think it would be more agreeable to the dentists of the town if the four lectures were given to each of the different dentists rather than to one but, however, they can endeavor to arrange that themselves.

Dr. Manning.—It might be arranged that man officially responsible for that could provide a substitute. I am heartily in accord with this; I think it is a move in the right direction.

Dr. F. W. Barbour.—Dr. Murray speaks of giving four lectures a season. I think that if different dentists did this they would duplicate each other and leave out a lot of matter. However, I was not present at the meeting of the Board in Fredericton, but just as the close of the discussion and I had no knowledge as to what they were doing. I was asked if I thought I could undertake it, but I could not, and I do not think one man could do it.

President.—Perhaps this matter could be arranged in detail a little later.

Dr. C. A. Murray.—I think this discussion might be taken up more profitably by the report of the committee which will bring up the President's address.

It was decided to do this and the report of the Council was then read, as follows:

St. John, N.B., July 11, 1911.

Gentlemen,—The Council beg to submit its report as follows:

In accordance with the Society's resolution of 1910, the Council met and formulated a bill amending the Dental Act—copies of same were sent to the several dentists throughout the province and the same submitted to the Legislature for enactment. A deputation from the Council were in attendance at the meeting of the Legislature and with slight amendments to same had the bill passed. A certified copy of the amended bill has not as yet been received.

Messrs. W. R. Wilkes, D.D.S., Fredericton; A. J. Cormier, D.D.S., Shediac, have complied with the law and have been duly registered.

The financial standing is as follows:

Cash received during year	\$ 55.88
Cash on hand July 12, 1910.....	230.00
	<hr/>
Total	\$285.88
Paid out as per vouchers	134.13
	<hr/>
Balance	\$151.75

A motion was made that the report of the Council be received and entered on the minutes, which was seconded and carried.

The next in order was the reading of papers and addresses, but it was put to motion and carried, that the order of these papers be transposed and held over until later.

President.—The next order of business is the selection of a place for the next annual meeting.

Secretary.—I have a letter here from the Secretary of the Nova Scotia Dental Association relative to this matter, which is as follows:

Halifax, N.S., June 17th, 1911.

Dr. F. A. Godsoe:

Dear Doctor,—I have had several suggestions relating to a combined convention of the N. B., P. E. I. and N. S. Dental Associations for next year. C. Ash & Sons were anxious for it to take place this year, but the suggestion came too late to be acted upon.

Such a convention would better take place in either St. John or Halifax. Will you let me know your views on the subject and bring the matter up at your coming annual convention.

I am writing Dr. Lodge of the P. E. I. Association with regard to this matter, and if I hear favorably from you and him, will bring the subject up at our convention.

Yours very truly,

(Sgd.) R. E. MACDONALD,

St. Paul Building,

Halifax.

I understand this is not the request from the Nova Scotia Dental Association, it is simply from the Secretary who has had the matter suggested to him by some of the supply houses and he wished to get an idea of the other Secretary's opinions and then he would bring it up. I inferred he wished the matter brought up at this Association and see what they thought, and if they would be agreeable to have a committee appointed to take it into consideration with the other associations, and if they should also feel favorably towards it, to have a joint meeting.

Dr. Thompson.—I was wondering if it would be well to have a meeting next year. You know the Canadian Dental Association meets next year, and a great many of us will probably want to go to that, and perhaps it would be better not to have a meeting next year.

Dr. McAvenny.—We tried the plan of a Maritime Association and it was a great failure. We went over with the Association and the result was that the New Brunswick Association paid the bills. I think we are not on for anything of that kind. We can have a joint meeting.

This was the intention to have a joint meeting. We started to have a Maritime Association which fell through after some few meetings, but there seems to be a desire on the part of quite a number of the Nova Scotia men who would like to have a meeting once in a while with the other provinces in the Maritime Provinces and get up quite a good meeting, but we could only, as far as I can see, go into it in the way of a joint meeting. It is with the members of the Association to say whether we will take it up next year.

Dr. Broderick.—The main object of a joint meeting would be the fact that perhaps our clinics might be some better than they are, and perhaps the mere fact of us coming together, that is the

different Associations, would lead to better clinics. I do not see that we could do other than have our own meeting. Still we might meet jointly. We might have something in the line of some good clinics. As we all know it is very difficult to find men who are willing to give clinics. To have a joint meeting with the other provinces, perhaps the objects accomplished would be worth while.

Dr. C. A. Murray.—I think the suggestion thrown out by Dr. Thomson is worthy of consideration. I do not think it would be well for us to consider a joint meeting next year. A good many of us would like to go to the Dominion Dental meeting. Now, after the meeting with the Nova Scotia Association that we had some years ago, we endeavoured to form a Maritime Dental Association. We had several meetings which were very, good but the result was that we killed our Provincial meetings, which I don't think is what the spirit of the movement ought to be, and finally we dropped them. As regards a dental meeting with the other provinces once in a while, I think it would be profitable; but as far as meeting in St. John and Halifax is concerned, I think that is the extreme end of each province. I would suggest that if we had a meeting of that kind Moncton would be about as central a place as you can find. It is the hub of New Brunswick, and certainly I think we could entertain the delegates all right, and get a chance to make a display. It is near Prince Edward Island and different parts of Nova Scotia can be reached very easily. It is also very convenient for the northern part of New Brunswick and St. John people. If we endeavoured to send down a number of tickets to St. John we could get quite a number out. Therefore, I think if we had a joint convention and arranged everything satisfactorily, we could have a very profitable meeting. As Dr. Broderick said, we can certainly learn a great deal from the different clinics, and it is a very difficult task to get them.

Dr. Broderick.—We had a very nice time at Moncton last year.

Dr. Broderick.—Have we a by-law that we must meet in St. John on the alternate years?

Dr. Godsoe.—I think there is.

Dr. Thomson.—I would make a motion that the Secretary of the New Brunswick Association officially notify the Secretary of the Nova Scotia Association that New Brunswick Association is in favor of the joint meeting of the three societies in 1913, but not a combined meeting of the three societies; and on behalf of the Moncton dentists I say that we, the dentists of Moncton, would be glad to ask them there. On account of the meeting of the Canadian Dental Association it would be difficult not to neglect our own Association if we had a joint meeting next year. Also we might be able to have more papers and more clinics by having it another year.

Dr. Manning.—I second the motion that the Secretary of this Association inform the Secretary of the Nova Scotia Association that we are in favor of having the joint meeting with them in 1913

and not next year, on account of our Canadian Dental Association meeting. Carried.

That does not dispose of our next year's meeting.

Dr. F. W. Barbour.—We would like to have the convention come to Fredericton, but the last meeting we had there did not amount to very much. I would like to have Dr. Broderick to help me and between us we might make something of it. We should like to ask them very much, but Moncton was so good last year that it makes it hard for all the others to come up to it.

Dr. F. C. Bonnell.—Could we not decide this question to-morrow morning?

Dr. C. A. Murray.—I remember some years ago that we had a meeting at Sussex and it was a most successful one, one of our most successful. Since that time there have been an extra number of resident dentists come to Sussex and I am sure we could not go to a prettier place. It is magnificent in every respect. The people are hospitable, and I am sure we would be entertained very nicely, judging from the people and the dentists who are there. I think we have representatives here to-day from Sussex and maybe they feel a little bashful about asking us, and if we call upon them we would be very glad to hear from them.

Dr. Godsoe.—I think it would be better to give them sometime for consideration, and I would ask you to go back to Reports of Committees. I had forgotten about the Committee of Entertainment, and as I would like to give the others a little time to consider this question, we will call upon Dr. Bonnell.

Dr. C. A. Murray.—I move we return to the order of Reports of Committees.

This motion was seconded and carried.

Dr. F. C. Bonnell.—We have an Entertainment Committee and we have arranged for a trip this afternoon on the St. John River. We expect to leave Indiantown at 2 o'clock in a large motor boat and will go to Westfield. We have a caterer and have arranged for entertainment of various kinds, and no doubt you will all enjoy yourselves. We have been a considerable time in getting this up and would like everybody to come, and bring his wife. We will leave Indiantown at 2 o'clock, arrive at Westfield at 3.30 and have entertainments and sports and then have dinner at 6 o'clock, and start back to Indiantown, arriving there about 8.30. Take a car at the foot of King Street and go to Indiantown, where some of the Entertainment Committee will receive you and tell you where to go. We hope everybody will come.

President.—The Association will be very glad to accept your kind invitation. We will not meet here again until to-morrow morning at 10 o'clock or whatever time will suit. In the meantime we have quite a representation from our different supply houses who have gone to great inconvenience to give a good exhibition here, and it is only due that we should give them some attention.

Moved by Dr. L. Somers, that the meeting adjourn until tomorrow (Wednesday) morning at 10 o'clock. Seconded by Dr. Thomson and carried.

July 12th, 1911.

The adjourned meeting was called to order at 11.30 on the above date. Mr. President Hart in the Chair.

President.—Gentlemen, we have been a little slow in getting together this morning; some of our clinics have taken a little more time than was expected. We will start in now. We left off at our last meeting under Section 8, Selection of place of Annual Meeting.

Dr. Barbour.—Since yesterday's meeting I have had an opportunity to consult with one of the dentists from Fredericton, and so far as we are able to judge matters we feel that we are justified in inviting the Convention to meet in Fredericton, so long as it is not intended to be a joint meeting. I hope the gentlemen here will feel that it is their Convention and that they will co-operate to make it a success.

Dr. C. A. Murray.—I move that the invitation of the Fredericton dentists be accepted for the Annual Meeting to take place in Fredericton in 1912.

This motion was seconded and carried.

(To be Continued)

Editorial Notes

Dr. Chester Smith, R.C.D.S., 1911, is in practice in Vancouver.

The Nelson News, says there is an opening for a dentist at Greenwood, B. C.

Dr. A. A. Lockhart, Tufts College, 1911, has begun practice in Summerside, P.E.I.

Dr. Weagant, Portage la Prairie, Man., has sold his practice and moved to Winnipeg.

Dr. C. W. Bowbear, St. Clair, Mich., gave a clinic to the Elgin Dental Society, Nov. 25, 1911.

For these remarks Justice Archer caused Mr. Lefkovitz to pay \$75 damages to Dr. Garneau.

Dr. Hart, of Beaverton, Ont., who has been ill for some weeks, has returned to his practice.

The Dominion Dental Journal wishes its readers and friends a Merry Xmas and a Happy New Year.

One of the important features of Dental College life at the R.C.D.S., is the fortnightly informal dances.

Dr. S. J. Sims, Fenelon Falls, delivered an address on the care of the teeth to the Women's Institute, October 20.

The fourth annual meeting of the Hamilton Dental Society was held on Monday evening, October 9th, 1911, at the Hotel Royal.

Dr. A. W. Thornton was a candidate for nomination in West Toronto, but was not well enough known to carry the convention.

Do you make gold inlays for the anterior teeth without pins when there is heavy occlusion and recement them every year or so?

Do you make gold inlays for the anterior teeth and avoid the conspicuousness of the gold by placing a silicate on the labial surface?

Dr. Bass is practicing in Hanley.

The Dominion Dental Journal has been the official journal of the Hamilton Dental Society appointed the official journal of the Hamilton Dental Society.

Quite a discussion has arisen over the suggestion to use nursery rhymes fixed up to have a dental hygienic value in the kindergartens of Toronto.

Instruction still goes forth to brush the teeth up and down. To brush the upper teeth upwards is worse instruction than to brush them back and forth.

The public school nurses of Toronto have agreed to supply a dental chair in Earls-court for the care of the poor children, if the School Board will maintain it.

To clean small particles of pulp from a barbed broach pass it over toilet paper or the paper which is wrapped in rolls of rubber dam. Don't read this and forget to try it. It is worth while.

Dr. W. M. McGuire, Waterford, is a candidate for the Legislature in Ontario. We hope to be able to report his election. Dr. Crow, of Chesley, was also chosen by his convention, but later resigned.

How we crave for the wonderful. A picture of a baby together with a long article commenting on the fact that it was born with a tooth, is being published throughout Canada. The fact is not so unusual as to demand such notoriety.

The general press is publishing an article from a "family doctor book" to the effect that the tooth brush is used too much. It says many teeth are literally worn away with the brush. Patients need the advice of a dentist, not a "doctor book."

A dental appliance, providing means whereby a flat blast of air will be delivered between the face of the patient and that of the operator, thereby preventing each from inhaling the other's breath, has been patented, No. 1,001,361, to Charles W. Davidson, of Jefferson City, Mo.

Dr. Bowbeer demonstrated the open faced crown before the Elgin Dental Society.

A testimonial banquet was given to Wilber F. Litch, at Hotel Walton, Philadelphia, December 16, 1911.

Dr. J. A. Simpson, Trenton, Ont., is just recovering from typhoid fever, but will not resume practice for some weeks.

It was found at St. Luke's Hospital, Montreal, that only 16 children had good teeth out of 4,351 children examined.

By some accident in the printing office after proofs had been returned, three or four lines of Dr. Belyea's paper got mixed with Dr. Sparrow's paper in the November issue of the Dominion Dental Journal.

Miss Bloom, Montreal, asked a Montreal dentist through the Courts for \$15.25 damages for extracting six teeth which she says she did not want extracted. Miss Bloom could not speak English, so gave her instructions through an interpreter. The dentist says he extracted the teeth as directed. The Judge awarded no damage.

Dr. C.A. Murray, dentist, Moncton, N.B., has been awarded a \$150,000 contract on Grand Trunk Pacific Railway building station houses, freight sheds, coal houses, etc., from Moncton to Plaster Rock, a distance of 160 miles. Beside this, Dr. Murray has one of the largest practices in the Maritime Provinces.

Mr. Louis Lefkovitz, of Montreal, said to Dr. Garneau, in the presence of his patients "You know Sheldon. Your case is the same. You obtain money under false pretences. I don't know how you keep your clients, and I am puzzled that they allow you to practice dentistry. I am a Hebrew, but I will turn a trick on you and you will not be able to practice any more."

There are thirty dental surgeries for the treatment of children in Sweden where there is a population of five millions. There is not one in all Canada. Since the establishment of these surgeries, children are more attentive at school and more regular in attendance. It is also found to be wiser to charge a fee where it can be afforded for the service than to do it for nothing.

Dr. W.J. Bruce, President of the R.C.D. S., fell when out hunting and broke his leg. He has now been confined to his bed for some weeks, but is making satisfactory progress toward recovery.

Some have expressed the fear that copper oxide might contain arsenic oxide, but there is good authority for the statement that the production of arsenic free copper oxide and cobalt oxide was solved long before these oxides were used in cement manufacture.—E. P. Dameron, D.D.S., in The Dental Brief.

Dr. J. E. Stewart, Lethbridge, Alta., was last month elected to represent the city of Lethbridge in the local Legislature. We congratulate the city of Lethbridge for the wisdom of its choice. Few dentists have the time to devote to politics. We are confident that Dr. Stewart will take a very prominent part in the affairs of his province. Dentists who go into public affairs are never back benchers.

ECONOMY IN EDUCATION.

The chairman of the Cleveland Committee believes that a conservative estimate would put the increased efficiency of all the school children of the city through proper treatment of their teeth at ten per cent. On the average, then, they are now losing ten per cent. of the value of the educational opportunities offered them, which in Cleveland costs for each pupil in the elementary schools \$26.25. The total loss at \$2.62 per child would be \$170,000 "in good money lost to the community," to quote the report. On this showing he urges that this much be saved by spending whatever is necessary to keep the pupils' teeth in good condition, arguing that there is no economy in turning out from the school graduates ten or fifteen per cent. short in working efficiency, when this is not inevitable.

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\$3,000 a year practice. Asking nothing for good will. Will sell whole or part of office furnishings cheap. Apply to the Dominion Dental Journal, box 25.

Obituary

DR. W. D. MACLAREN THROWN FROM HIS HORSE.

Dr. W. D. MacLaren was thrown from his horse at a late hour on Thursday night, October 12, on his way into Barrie, Ontario, from attending a small gathering at Major Fred Sneath's in Vespra. He left Mr. Sneath's a few minutes after the other members of the party and passed them near the Union Cemetery. As the rig was reaching the Catholic Cemetery, a dark object was noticed in the middle of the roadway, and was at first thought to be a log, but on investigating it was found to be Dr. MacLaren, in an unconscious condition. He was placed in the rig and brought to town, but never regained consciousness, passing away at 7.30 on Friday morning, October 13, 1911.

As Dr. MacLaren was an experienced horseman and an expert rider, it is supposed his horse bolted, or while riding rapidly, the horse stumbled, throwing him. The lines were dragging when the horse reached the stable, thus indicating that its rider was thrown over its head. A blow on the head resulted in concussion of the brain, and though doctors were with him in a few minutes, they were unable to counteract the effects of the fall.

William Douglas MacLaren was a son of Rev. Alex. MacLaren, a Presbyterian Clergyman of Hamilton, and had been in Barrie practising his profession for 17 years, coming here in 1893, after being in Midland for 3 years. For three years he was Secretary of the Corinthian Masonic Lodge and took an energetic interest in all sports, particularly those of an aquatic nature. In 1906 he joined the cavalry regiment organized by Major Frank L. Burton, as a lieutenant, and later secured a captaincy, and his majority. On Major Burton's retirement from the command of the local squadron of the Mississauga Light Horse, he was succeeded by Major MacLaren, who proved to be a zealous and painstaking, as well as a popular officer.

He is survived by his wife, formerly Miss

Georgia MaConchy, whom he married ten years ago.

Dr. MacLaren was born in Wakefield, Quebec, 43 years ago, and educated in Almonte, Ont., before entering the dental offices of Dr. Sinclair in Hamilton. He was a member of the Barrie Presbyterian church, and occupied a seat on the Board of Managers for three years.

MISS SADIE HOLMES.

The death of Miss Sadie Holmes, of Tillsonburg, Ont., has removed from the Dental Profession of Ontario one of its most conspicuous figures. She entered a dental office as an assistant, and after many years of service became somewhat versed in the details of dental practice. She applied to the Ontario Legislature for a license to practice, which was granted on condition she attended College one year and passed the final examinations, which she did. She took up practice in Tillsonburg, where she lived with her mother. In a few years she had gained a good practice and the confidence of the people in her town. About a year ago her health began to fail. She gradually became worse and gave up her practice. Just before her death she underwent a surgical operation. A few hours before her death she was married to Mr. Mahon, a barristor, of Cobalt, Ont.

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Dental practice, Winnipeg. Office especially designed for dentist; best location in city; equipped in most modern method one year ago in every particular. Ill health. For particulars write Box 2, Dominion Dental Journal.

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Dental practice of the late Miss S. Holmes, of Tillsonburg, Ont. Practice averages \$4,500 yearly. Good opening for active man, to acquire a practice among the best people in town and surrounding country. Apply to Mr. J. Carruthers, Barrister, Tillsonburg, Ont.

Reviews

DENTAL MATERIA MEDICA AND THERAPEUTICS, with special reference to Rational Application of Remedial Measures to Dental Diseases. A textbook for students and practitioners, by Hermann Prinz, D.D.S., M.D., Professor of Materia Medica, Therapeutics, and Pathology, and Director of the Research Laboratory, Washington University Dental School, St. Louis. Second revised edition. C. V. Mosby Company, St. Louis, 1911. Price, \$3.00.

This has become a standard in dental materia medica and therapeutics. This, the second edition, appears only two years after the first. It speaks well for the popularity of the work to have another edition out in so short a time. There is no more authoritative work on this subject. The author is a student and scientist, and this work reflects the genius of the writer. It contains the latest thought on this important subject as culled from German scientists and the practice from American dentists. It is impossible, in a review, to give any adequate idea of the value of this book to the general practitioner. The chapter on general and local anaesthetics contains the best scientific thought and the most recent practice. This chapter should be read by every dentist who uses these aids in practice. In the opinion of the reviewer this book is especially adapted for the practitioner. The publishers have done well to produce so handsome and securely bound a volume.

PRACTICAL DENTAL METALLURGY, a Text and Reference Book for Students and Practitioners of Dentistry. Embodying the Principles of Metallurgy, and their application to dentistry, including experiments, by Joseph Dupuy Hodgen, D.D.S., Professor of Operative Dentistry (formerly Professor of Dental Chemistry and Metallurgy), College of Dentistry, University of California, revised by Guy S. Millberry, D.D.S., Professor of Chemistry and Metallurgy, College of Dentistry University of California. Fourth edition—com-

pletely revised. C. V. Mosby Company, St. Louis, 1911.

In this edition no effort has been made to change the pedagogic scheme of the author, which has received the endorsement of the teachers in the profession, both by personal expression and by the adoption of the text in many of the dental schools since 1897. The subject matter, however, has been thoroughly revised in harmony with the latest information obtainable.

In order to avoid confusion in the mind of the student, the metric system has been used exclusively, all other systems of weights, measures and temperature having been eliminated, except the troy system and its application to precious metals, as any reform in this regard is obviously impractical.

Data for this revision has been gathered from all sources, including the more recent works on chemistry and metallurgy, but the bulk of the matter has been obtained from the journals of the American Chemical Society. Wherever possible, full credit has been given for all abstracts.

The pleasure of an intimate friendship with the author, first as a student and later as an associate in teaching, permits me to confirm the prevailing opinion of his qualifications as a teacher, and I trust his work may continue to merit the success which has previously been accorded it.

MODERN DENTAL MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS, including the practical application of drugs and remedies in the treatment of the disease, by J. P. Buckley, Ph. G., D.D.S., Professor and head of the department of Materia Medica, Pharmacology, and Therapeutics, and formerly director of the Chemical Laboratories, Chicago College of Dental Surgery. Third edition revised, seventy-two illustrations. P. Blakiston's Son and Co., 1012 Walnut Street, Philadelphia, P.A., 1911.

The first edition of this work appeared only twenty months ago. Two additions having been exhausted, indicates that the

book has been well received. The author says this edition has been revised and improved without increasing its size. A chapter or section on the surgical treatment of chronic alveolar abscess has been added to part II. This section is a valuable addition. This is a work especially adapted for college teaching. It is concise, well arranged, clearly written, well printed and securely bound. It is distinctly the author's book. He constantly refers to his personal methods. As the methods of practice advocated are generally based on sound principles and experience the book

has a more vital interest to the student. The style is that of the class room. If it should in future be found necessary to get room for new matter without increasing the size of the book, the page devoted to tobacco might be left out, because the last sentence says "Tobacco is not used therapeutically in dentistry." Why discuss it in a work on dental therapeutics?

A large number of dental schools use this book as a text, and an increasing number of practitioners look to it as the authority for their methods of practice.

THE HAMILTON DENTAL SOCIETY.

The November meeting of the Hamilton Dental Society gathered at dinner in the Jockey Club Hotel Monday, 13th. Joseph S. Graham, M.B., M.R.S.C., gave a strong address on sterilization. The informal talk is by far the most enjoyable accompaniment to dinner.

Professor Graham outlined the material conditions, fresh air, sunshine and plain cleansible equipment which makes the office as antiseptic as possible. Then he discussed intimately the possibilities of infection from use of the various pieces of standard operating equipment. Suggesting the advantage of enamel, removable glass, slabs for instruments, cement floors with rounded corners, lots of running water and someone to keep the place clean. It speaks rather hopefully of dentistry that this is practically the trend of dental furnishings of the hour, but to hear the Doctor tell through the thin veil of a very good cigar and a comfortable feeling toward the world at large, just why we should do these things and add the very latest little odds and ends that build up the pile of asepsis over which microbes have to crawl; Well; it is to make some changes next day in your office, that helps.

Following this, Dr. Graham analysed the numerous methods of sterilization and impressed the fact that while you could not grow a culture in the proprietary mouth washes which are often used for sterilizing instruments, you could grow a culture on the instruments immediately afterward,

which is to say that these solutions are not fit company for decent instruments. Pure carbolic is not certain under a minute and a half and then not desirable.

Formaldehyde Vapor is not efficient but must be distinguished from Formaldehyde fumes, which is stronger and efficient in disinfecting rooms.

Boiling on a rack in a suitable boiler is the scientific way of disinfecting and the one recommended. Dr. Graham also recommends the closing up of the operating room and the burning of Formaldehyde and permanganate cones once every month, too. He thought a dental office must become infected by constant use like laboratories. During the discussion the Doctor said he had found sometimes a patient would come in and leave without paying the fee. That, perhaps the following dozen would skip in the same manner, this he considered the most difficult germ to eradicate.

J. A. C. HOGGAN, D.D.S., Secretary

DENTAL WEEK IN CHICAGO.

Outline Program.

Chicago Dental Society.

Monday, January 22, 1912, (all day) — Manufacturer's Exhibit.

Monday evening, 8 o'clock—"Comparative Dental Anatomy," Dr. William Bebb.

Tuesday, January 23rd, (all day)—Clinic College of Dentistry, University of Illinois.

Tuesday evening, 8 o'clock, paper, "Salivary Calculus," Dr. G.V. Black.

Institute of Dental Pedagogics.

Wednesday, January 24, 9 o'clock— Address of welcome, by the Mayor of Chicago; President's address—Dr. Donald M. Gallie; Report of Master of Exhibits, Report of Commission on Text Books, visit Field Museum, 2 to 5 o'clock; teaching of Comparative Dental Anatomy, Dr. William Bebb.

Wednesday evening, 8 o'clock—Banquet (Hotel not yet selected); address by — (Prominent speaker of national reputation).

Thursday, January 25, 9.30 to 11.30—visit Northwestern University Dental School, luncheon 11.30 to 12 o'clock; automobiles to West Side, visit Chicago College of Dental Surgery, 1.30 to 3 o'clock; visit College of Dentistry, University of Illinois, 3 to 5 o'clock.

Thursday evening, 8 o'clock—paper, "The Teaching of Dental Histology," by Dr. Fred B. Noyes.

Friday, January 26, 9 o'clock—"The Teaching of Applied Physics and Chemistry," Dr. Marcus L. Ward; report of Commission on Nomenclature; report of Dental Index Bureau; 1.30 o'clock, "The Teaching of Clinical Pathology," Dr. H.T. Smith.

COMPLIMENTARY DINNER TO DR WILLIAM WALLACE WALKER.

A complimentary dinner will be tendered to Dr. William Wallace Walker on the evening of Saturday, January 20, 1912, at the Hotel Astor, New York City. The dinner is given by the First District Dental Society of New York.

Dr. Walker has devoted himself for many years to the advancement of the interests of this Society, and, in addition to inaugurating a very successful series of Post Graduate Study Sections, has also harmonized the conflicting society interests of the metropolis by merging all the existing societies in the First District Dental Society, which therefore now includes the New York Odontological Society, the New York Institute of Stomatology and the New York Institute of Dental Technique.

The Committee makes this public announcement because they fear that some of the many hundreds of friends of Dr. Wal-

ker throughout the country may accidentally fail to receive an invitation. All who desire to be present are therefore requested to waive formality and send their acceptances at once to the Treasurer, Dr. James W. Taylor, 106 East 57th St., New York, enclosing the subscription price—ten dollars.

Safford G. Perry, Chairman; Henry W. Gillette, Secretary.

THE INTERNATIONAL MILLER MEMORIAL FUND, CANADA.

A preliminary list of provincial subscriptions.

Alberta, Chairman H.F. Whittaker	
British Columbia, Chairman R. F. Verrinder.....	\$ 25.00
Manitoba, Chairman M.H. Garvin...	239.00
Nova Scotia, Chairman G.K. Thompson.....	20.00
New Brunswick, Chairman J. W. Moore.....	22.00
Ontario, Chairman, W.J. Bruce.....	600.00
Royal College of Dental Surgeons...	100.00
Prince Edward Island, Chairman J. S. Bagnall.....	5.00
Quebec, Chairman, Eudore Dubeau..	26.00
Quebec, Chairman F.A. Stevenson...	103.00
Quebec Dental Board.....	100.00
Saskatchewan, Chairman F.C. Harwood.....	45.00
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